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COMMODORE

WORLD

THE NEWS MAGAZINE FOR COMMODORE 64 & 128 USERS

Volume 1, Number 1
April 15, 1994
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PREMIER ISSUE

Printers
Our in-depth look into selecting and using printers and printer interfaces

CMD DOS
An introductory look at what makes CMD devices tick

GEOS
Steve Vander Ark takes a stab at Morphing with GEOS

Review
QWKRR 128 simplifies offline replies to FidoNet

Plus...
- On The Horizon
- Just For Starters
- Top Tips
- BASIC Instincts
- Advanced Techniques
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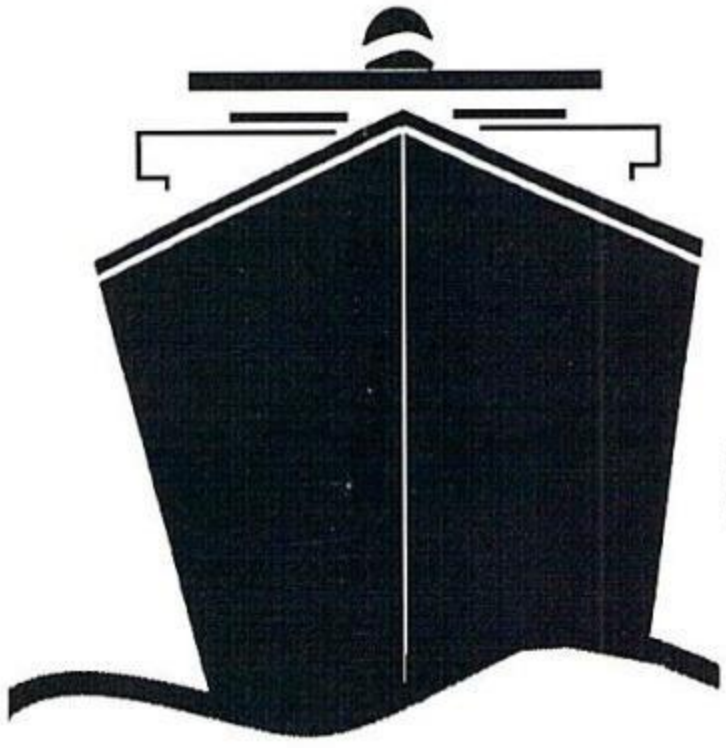

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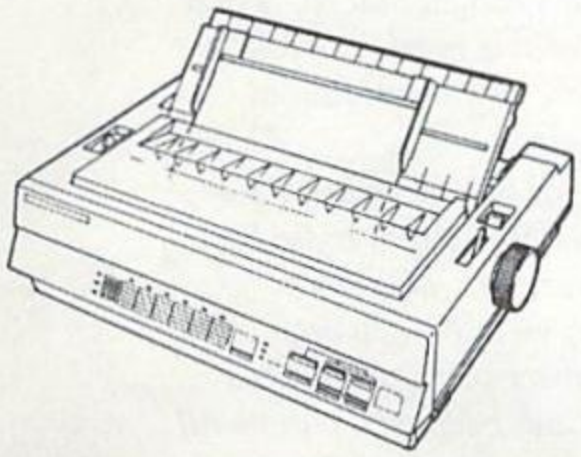

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On The Cover

Star's new 2480 Rainbow 24-pin printer.
Cover art by Mark Douglas.

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FROM THE EDITOR...

Strange as it may seem to be writing this, here I am. After all, who could have imagined a few years ago that CMD would put it's efforts into producing a magazine for the Commodore 64 and 128 market. We'd always taken it for granted that RUN and Compute's Gazette would be with us for as long as there was a viable market. While a lot of the earlier magazines fell by the wayside, that was due more to natural fallout than anything else.

When RUN threw in the towel, we were a bit suprised. It seemed very premature for them to leave at that time. While we hadn't always liked the content of RUN, it did keep the market connected, and supplied vendors with a place to advertise. Compute's Gazette did too, though we felt to a lesser degree ever since they were bought and merged into the multi-editions. Their constant problems with subscription problems didn't help either, and they became somewhat notorious for it. Sad, because I can recall starting out in my early days with Compute!, and it gave me endless hours of pleasure.

With the announcement that Compute's Gazette would convert to a disk-based publication, we knew something had to be done. The upstart dieHard has done well, and we're glad that they have. But the market can certainly handle more than one paper-based publication, and many are fearful to deal with upstarts. We could only conclude that CMD needed to put it's name and knowledge into a new publication—the one you're now reading.

Strange as it may seem for us to find ourselves in the magazine business, it's a role which we take seriously. We hope to provide users with the kind of information that they want, and in a timely manner. Sadly, this first issue is arriving a couple of weeks later than we had hoped; but being our first issue, we've had a few hurdles to clear, and a lot of things to learn. We fully expect forthcoming issues to remain on a stable schedule, with a new one arriving in your hands every six to seven weeks.

There's a lot inside this issue, but expect even more in future issues. You'll notice that we've opted for a lot of regular columns and a single main feature article. We may expand on the features somewhat over the next few issues, but we won't be cutting back on columns to do it. We feel that the regular columns do more to bring users constant information on their favorite subject, and we hope you'll agree. Our review section will also grow, with more pages devoted to it beginning next issue.

Before I close, I have to extend the thanks from our staff for the strong subscription support we've received early on. We're hopeful that we'll be able to meet your expectations. Whether we do or not is partly up to you, though, so please take the time to write us and let us know how we're doing.

Doug Cotton
Commodore World Editor

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ON THE HORIZON

COMMODORE AND COMPUTER INDUSTRY NEWS

Commodore Stock Plummets

Certainly Commodore has had their share of problems over the last few years. Now stockholders in CBU have some 'share' problems of their own. Commodore stock on the NYSE has dropped somewhat steadily over the past few years, and has hovered at very low levels over the past year. But after the release of somewhat dismal 2nd quarter earnings early this month, CBU stock went on a selling frenzy that caused the NYSE to suspend trading until a price could be set to equalize the number of sellers and buyers. At this writing, CBU stock is priced at 37.5 cents per share.

Meanwhile, rumors are spreading like wildfire that Commodore will be taken over by institutional investors, go on the auction block, or be bought out. Regardless of what happens, it is assured that it will have little or no effect on current Commodore 8-bit users.

I Paint and I Port Update

We've received word from Living Proof, Ltd. that upgrades have recently been performed on I Paint and I Port. I Paint is a powerful interlace mode drawing program for the C-128. The new version, 1.5, has approximately 35 new or updated printer drivers, including color drivers for 9- and 24-pin Star printers, Panasonic's KX-P2123c, and Okidata's model 293, and Okimate 10 and 20. Other new and updated drivers include LANDSCAPE drivers, HPL-III drivers for HP Deskjet and Laserjet, Epson and Star 9- and 24-pin drivers, and high-density three pass drivers for 9-pin printers. Living Proof considers this upgrade to be minor, however, they feel that it may be an important upgrade to users with the specific printers whose drivers have been updated.

I Port, the company's graphic conversion utility program, has gone through a more substantial upgrade. Currently at version 1.54, it now handles conversions for IFF and Koala files (introduced in v1.5), and accepts GIF files beyond the 87A standard (though additional features beyond those in the 87A standard are not supported). Living Proof also indicates that added improvements have been made to the user-interface of this program.

Retail prices of these packages are $39.95 (I Paint), $29.95 (I Port), and $59.95 for both. Owners of I Port version 1.2 may upgrade to the new version for $10 with the return of their original v1.2 disk. No information was provided for upgrading I Paint. The company may be contacted by writing to:

Living Proof, Ltd.
P.O. Box 80714
Minneapolis, MN 55408-8714

Creative Pixels Finds Prehistoric Man

Creative Pixels LTD., a Library, PA company, has recently announced the release of a new game for the C-64. The new program, *A Day in the Life of a Prehistoric Man*, is the fourth game to be released by the company. The following synopsis was provided:

"Join your host, Salisbury Smythe, in a world premiere television documentary on Public Network Television. As the documentary continues, the player participates in the daily routines of a prehistoric man. These routines include bone collecting, saving your mate from cave apes, discovering fire, and dodging dinosaurs. The game is a mixture of arcade action, adventure, and comedy."

With this new game, scheduled for release on April 8, 1994, Creative Pixels confirms its commitment to supporting the C-64 market with new products. For further details, write:

Creative Pixels
P.O. Box 592
Library, PA 15129

New Digitized Sound Editor Released

Autumn Software has recently released Digimaster, their new digitized sound editor software for the Commodore 64. Digimaster can edit and play 8 bit digitized sounds using all 8 bits, for a vast improvement in sound playback quality. It features a graphical user interface which supports controller input from either a mouse or joystick, cut and paste editing, and a range reverse function. Included with the software are utilities for adding digitized sounds to your own programs, a utility for converting Amiga IFF sound samples, and instructions for interfacing Amiga sound digitizing hardware to a Commodore 64 or 128. The new program is currently available from Creative Micro Designs, Inc.

Commodore 128 and CP/M Software

A Commodore users group in Virginia, called MPCUG, puts out a set of twenty C-128 disks (1571 format, but you can ask for 1541 or 1581 if you need them). The 20 disks are from a collection made by a fellow called Ernie Tipton, and at last report the entire collection was a real bargain at a cost of only $10.00 plus $3.00 for shipping. There are 18 disks of C-128 software, and two disks of CP/M software - including programs to transfer between CBM and CP/M formats. You may contact the group concerning the 'Tipton Disk Collection' at the following address:

MPCUG,
P.O. Box 391,
Gloucester, VA 23061

Music/MIDI PD Software Source

The Music Software Exchange has a large number of C-64 and C-128 music and MIDI software items available, offering both commercial and Public Domain programs. Contact them at:

The Music Software Exchange
P.O Box 533334
Orlando, Florida 32853-3334

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CMD Launches New Magazine

Creative Micro Designs, Inc., an East Longmeadow MA firm, recently announced plans to publish a new magazine for the Commodore 64 and 128 computer user. The new publication, dubbed Commodore World, should be shipping by the time you read this. Hmmm... I see you've already got a copy. Nevermind.

Star Unleashes Two New Rainbows

Star recently released two new 24-pin color printer models, the Star 2450 Rainbow and the Star 2480 Rainbow. The 2480 offers three paper paths, 18 bit-mapped and 15 Truetype fonts, and features an LCD status display. The 2450 is a radical new design which looks more like a laser printer than a dot-matrix. It uses a top-feed cut-sheet paper tray and prints in a face up/face down manner similar to laser printers. This model comes with 10 bit-mapped fonts and 15 Truetype fonts. Both models have full color and are Epson LQ-860 and IBM Proprinter 24E and 24P compatible. Star Micronics America, Inc., (212) 986-6770.

New Epson 3260 Printer

Epson has recently made a new addition to its Action Printer series, the Epson Action Printer 3260. The 3260 is a 24-pin printer, comes with a 50 page cut-sheet paper feeder, and is rated at 216 cps. A color upgrade can be added by the end user with a $49 color kit. List price of the printer is $299. For details, contact Epson at (800) 289-3776.

Patents Getting Out of Hand?

Recent events in the use of patents to gain advantages in the computer market are creating quite a stir. Microsoft has been one of the hardest hit, losing a patent infringement suit brought by Stac Electronics over Microsoft's inclusion of data compression schemes in MS-DOS to allow user's to squeeze more data onto system storage devices.

Data compression itself is nothing new, and the programming algorithms used are in the public domain; but the patents involved apply more to exactly how data compression is put to use, and Stac appears to have the older applicable patent in this case.

Microsoft also had trouble with IBM last year over their software licensing agreements. In the end, Microsoft ended up agreeing to pay IBM in excess of $20 million for patent and licensing fees, due to IBM's huge holding of over 1,000 software patents. Now, while there are few that will argue in Microsoft's behalf, software patents are indeed getting a bit out of hand. Compton's NewMedia has recently been granted a patent covering computer-based retrieval of text and graphic data. The company now claims that this patent covers a large percentage of Multimedia products being sold or developed by other companies, and is seeking to gain substantial royalties from these companies.

To the end user, this means higher prices on such products, and fewer of these products coming to market. We can also expect slower response to patent requests and searches due to the huge backlog being generated by all this activity in the software industry (the U.S. Patent and Trademark Office reports having a current backlog of more than 3,000 software patents).

On a related note, it was recently brought to this reporter's attention that Televideo, a company which was once well known for its manufacture of mainframe terminals, owns a patent on the solid blinking cursor. While both IBM and Apple apparently side-stepped this issue by designing their own unique cursors, it's interesting to note that part of the money we paid for our Commodore machines was earmarked for Televideo due to this (in this reporter's opinion) ridiculous patent. Perhaps C-128 owners who opt to use the blinking underscore cursor could apply for a partial rebate?

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5. Follow sign-on instructions for access to The Phoenix.

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JUST ASKING

THE COMMODORE WORLD STAFF LOOKS FOR ANSWERS TO USERS' PROBLEMS

I have GEOS 1.2 which I got with my C-64. I am looking for a printer driver which supports a postscript laser printer. Do you know where I can find this?

- J. C., Lexington, KY

We are not aware of any laser printer drivers for pre 2.0 versions of GEOS. When CMD acquired manufacturing and distribution of GEOS 2.0 from Geoworks, support for older versions ceased. We are, however, certain that Postscript laser printer drivers are available for GEOS 2.0. An RS-232 version of the Laserwriter driver comes with GEOS 2.0, and a GEOCABLE version is available on an extra disk available from CMD. The GEOCABLE driver and a Postscript pre-processor utility for GEOPUBLASER are also available on Collette Utilities. You might want to check some of the advertisements in this issue for these products.

My friend was telling me about a rumor that someone was developing an 8 MHz cartridge for the 128. Is this true? If so, can you tell me where can I get one? How much faster will this make my 128 and disk drives?

- C.F., Rochester, NY

To the best of our knowledge, this is still just a rumor. Last year, a company called Parsec had publicized that it was developing such a chip, and had actually begun to take deposits. Unfortunately, this project appears to have been shelved.

One thing that you should keep in mind about running high speed processors on the

Commodore is that all disk access and VIC video memory updating must be performed at 1 MHz on both the C-64 and C-128. Because of this, every time the computer needs to access a disk drive, or update its video RAM, the processor must step down to 1 MHz before these operations can occur.

Speed deficiencies on the Commodore often are not the result of processor speed. Most complaints we have heard from Commodore users concerning slowness with their software have been attributable to disk operations - not processing speed.

Accelerators have been available in the past for the C-64, but even the best of these have suffered compatibility problems. Since a different processor must be used, any programs which use 'undocumented opcodes' tend to fail. Also, many programs written for the Commodore were written to run at the standard clock speed. When you increase the clock speed, these programs often operate so quickly you cannot control them. Imagine trying to beat your favorite game when the monsters come hurtling at you four times faster than normal.

While there certainly are some things which would benefit from a faster processor on the C-64 and C-128, you should take a harder look at what is causing the speed deficiencies in your specific software before assuming that a faster processor will be a cure-all. Stay tuned to *Commodore World*, though, since this topic is scheduled for an in-depth discussion in an upcoming issue in the *Peripheral Vision* column.

My computer system consists of a Commodore 128D, two 1581 disk drives, an HD-100 hard drive and an MPS-1000 printer. If I turn off either of my 1581 drives, my computer locks up when I try to load from any of the drives I have turned on. Is there something wrong with my drives?

- R.M., Mechanicsville, PA

This problem is more common than you might think. These symptoms are typical of 'Serial Bus Loading', a condition which occurs when drives or devices that are connected to the serial bus are turned off. When a drive or printer is turned off, it creates a load on the signals which move along the serial bus, weakening them or causing the signals to become 'skewed', or distorted. When this occurs, the other devices which you have turned on receive or send bad information on the bus, causing the lock-up. By turning all serial bus devices on, this condition is less likely to occur. Some computers are more susceptible to bus loading than others, but it is always a good practice to turn on all of your serial bus devices when using your computer.

JUST ASK!

If you're having trouble getting your system to do what you want it to, or think you've got something wrong with your hardware, *Just Asking* may be able to help find a solution, or get you pointed in the right direction. Send your questions to:

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c/o Creative Micro Designs, Inc.
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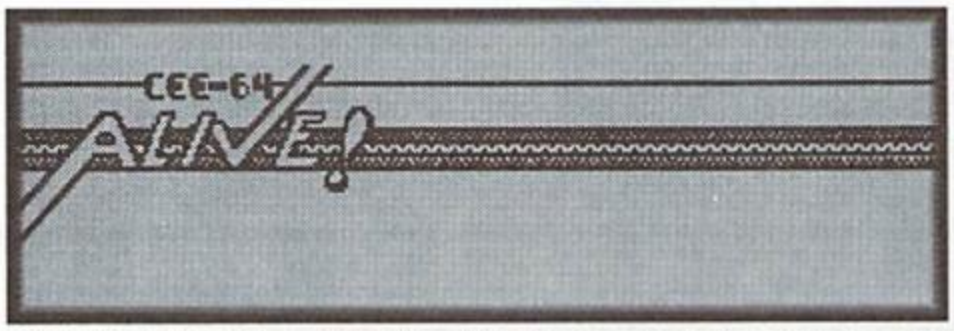
THE CONNECTION

News from Commodore-related Vendors and Publishers



CEE-64 Alive! is a friendly, down-to-earth disk magazine for Commodore 64 users. The philosophy behind CEE-64 Alive! is positive, enthusiastic support for C-64 computer users at an affordable price. We don't wear rose colored glasses, and we'll call `em as we see `em, but at CEE-64 Alive!, we *USE* our Commodore 64's, and consider ourselves first and foremost, Commodore 64 users. Each magazine issue includes at least two disks. We publish both articles to read and programs to run, along with a great deal of helpful information. Our last issue (Volume 3, Issue #1), included three disks instead of two, including a recipe data base, demonstration of new software, game hints, a paint program demo, and a wealth of information for Commodore 64 and 128 users.

Coming soon from CEE-64 Alive!, the North American edition of Commodore Network of Australia. Commodore Network and CEE-64 Alive! have been sharing articles and programs for two years now, via an agreement to publish each other's articles, but soon CEE-64 Alive! will be delivering more Commodore news with the North American edition of Commodore Network, which is a "paper" magazine. Watch for future announcements about it!

We're also proud to announce the debut of our own SIG (Special Interest Group) on DELPHI, one of the leading on-line services. Through the CEE-64 Alive! SIG, you will have direct access to the magazine staff, and will be able to download special software packages directly from CEE-64 Alive!.

DELPHI is easy to call and easy to get around in, which is why CEE-64 Alive! has chosen it as our "home" online service. To call DELPHI and take advantage of their 5-Free-Hour trial offer, just use your modem and dial:

1-800-695-4002

Press return once or twice, and at the Username prompt, enter:

JOINDELPHI

At the Password prompt, enter:

CUSTOM159

- Gaelyne R. Moranec, Editor, CEE-64 Alive!

This April will mark dieHard, the flyer for commodore 8 bitters' 30th anniversary issue. Issue number 300 will have some drastic changes. Find out why The Newsroom is now the preferred Desk Top publishing program and why dH has elected to use it over geoPublish. Files will not be printed out, but rather be on disk, so you'll have to own a copy of Newsroom to print out and read the articles that range from reviews of the latest Amiga hardware and software to... NOT!

April Fools — of course.

For those who don't know, dieHard is a magazine dedicated to the users of commodore 8 bits. What is an 8 bit? Well, Commodore made several over the course of the years. The most well known ones are the C-64 and C-128. dieHard supports not only the users of these great machines but we offer support to the C-16, plus/4, VIC20, as well as the various PET and CBM machines. This April's issue will be spilling out the sides with Cyberspace Cowboy programming and PRG!

Speaking of Cyberspace, Noel Plank, reknowned dH reviewer extraordinaire, will be entering this realm with REVIEW!s on the SupraModem 2400 and Bob's Term Pro. Archaic Computer takes a look at Injured Engine (also reviewed by Noel — we keep him busy!).

R.J. Smulkowski, dieHard's own Cyberspace Cowboy, gallop's us through new areas within Delphi, introduces us to ABBSA and speaks the truth!

DOS & Don'ts discusses reading the disk directory from your programs. It really is easier than you think.

Rarities, INPUT, Q&A and more! Pick up an issue today! What, your local commodore shop doesn't carry it? Then, see our ad in this issue of Commodore World for details on how to get yourself a copy today.

- Brian L. Croswaite, Editor and Chief

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LOADSTAR

FUN GRAPHICS MACHINE

1994! Who'd ever have thought that LOADSTAR would endure from 1984, through the march of the MS-DOS X86 machines, though the Windows revolution, all the way to 1994—and we're still uncovering new things on the C-64.

1994 brings us LOADSTAR MONTHLY and LOADSTAR 128 QUARTERLY on 3.5-inch disks. 1994 also brings us to the GEnie mall, with our own Download SuperStore. There, subscribers as well as non-subscribers can download individual LOADSTAR titles and charge them to their credit cards. There will be online support, and new titles added every month.

Naturally we're always hard at work to produce and secure our usual fine lot of monthly software. As our 10-year anniversary approaches in May, we're searching worldwide for the best programmers and artists to bring you the amazing value that has always been LOADSTAR. My personal goal in 1994 is to spread the word. Softdisk Publishing is the world's largest publisher of C-64 software though LOADSTAR, yet most C-64 diehards have never even heard of us after ten years.

For those unfamiliar with LOADSTAR, allow me to explain who we are: We're a monthly magazine on disk. Most people who try us, love us. Every issue of LOADSTAR comes jam-packed with about nine all-original programs. This includes mind-expanding games that any parent would approve of, programming tutorials, music, graphics, educational quizzes. Besides our feature programs, you'll be blown away by the regular features and editorials. There's even tech support when you need it. You'll also get our highly regarded monthly newsletter to keep you abreast of industry trends. It takes some subscribers an entire month to digest the whole package. By that time the next LOADSTAR disk set will arrive in the mail. LOADSTAR ships on two 5.25-inch disks (filled on all four sides) or on one 3.5-inch disk. Many disk magazines, on many computer formats, have come and gone, but we're the only one that can say we've been around for ten years. We've got our act together, a professional crew, and a ten-year record that speaks for itself. I'm very proud to be a part of that.

This year we'll also deliver to you even more new machine language tools that will help the programmer in you create better games, utilities and productivity software. There will be more contests and prizes. Last year we gave away three FD-2000s and one CMD Hard drive in our Codequest '93 programming contest. By the time this is published we'll have given away even more FD-2000s.

It's hard to believe that I've been with LOADSTAR for over 50 issues. I assumed when I moved to Shreveport that my job would be short-lived. Five years later, I have the best job in the world. I hope you'll join in. In future columns like these, I'll keep you abreast of what's current in LOADSTAR.

- Jeff Jones, Associate Editor, LoadStar

Greetings FGMers and future FGMers. *Commodore World* has offered us this column so we can give you FGM tips and keep you informed of FGM happenings.

I'm going to use this first column to introduce FGM to the few (millions) of you Commodore users out there who still don't know about FGM (if you know about FGM then you're already a user, right;). FGM stands for the FUN GRAPHICS MACHINE. In brief, FGM lets you place graphics and text on hi-res screens, manipulate, modify and edit the images and screens into whatever you wish (ie: forms, cards, newsletters, labels, calendars, fog charts, etc.), then print the hi-res screens in a variety of ways.

FGM is not intended to be a "drawing" or "paint" program. I'm not an artist and I'm pretty helpless when presented with a blank screen. When writing FGM my intention was to allow using pre-made images, such as the vast library of PS [PrintShop] images that are available. Additionally, screens from most drawing programs can be imported into FGM, and FGM saves screens in formats that can be loaded by many other programs. Although FGM was not intended to be a drawing program, I know FGMers who defy me and use FGM to create nice drawings anyway. Hints on drawing in future columns.

Compatibility has always been important, and FGM gets along great with CMD's line of products. FGM can be installed into RAMLink or any of the CMD drives. FGM loves JiffyDOS, and I rate JiffyDOS as the number-one best thing you can add to your Commodore. Buying JiffyDOS is like buying more time to use your computer.

Consider this; if you had a program that you loaded up once every day and it took two minutes to load, that's over twelve hours of loading time per year. With JiffyDOS the loading time would probably be under thirty seconds, which saves you (and your drive) over nine hours a year. Add to that the time saved with file handling and we can easily start talking days or weeks of extra computing time.

The FGM UPDATER DISK; I've received inquiries from users wondering if their FGM needs updating. This disk is for updating earlier v6.0-6.4 FGMs to v6.5 (the version number is on the FGM boot menu screen). If you purchased FGM within the last eighteen months then it doesn't need upgrading. Older FGMs will benefit to varying degrees. The updates aren't major, but the disk is well worth the low cost even if your FGM doesn't need updating; there are other useful things are on the disk. The UPDATER disk may be freely given to other FGM users, and may already be in your club's library.

Some HOT NEWS for users of The Write Stuff (TWS). Hugh McMenamin has finished The ILLUSTRATORII. This new version of The ILLUSTRATOR uses FGM clip art images instead of RUNPAINT, and includes other useful additions. Send your TWS user number and $5+$3.50 s&h to the Busy Bee.

Next month Jerry will take a turn at this, and he's full of expert advice on using FGM. I'll be spending the "time off" with my ml monitor, working on more additions to FGM. Until next time, Happy Computing...

- Ron Hackley:)

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FOREIGN EXCHANGE

By Joseph Gaudl

OUR OVERSEAS CONTACT GIVES HIS VIEWS ON THE EUROPEAN FRONT

"You mean to tell me that there are still companies offering hardware and software for the C-64? You've got to be kidding! Where can I get a catalog?" These are some of the "highlights" of a recent telephone conversation I had with an Austrian who called our office. He had seen CMD's ad in a German computer magazine and couldn't believe his eyes. He had been a C-64 freak during his teenage years when everyone who was someone had a Commodore C-64 or C-128. He had "Graduated" to an Amiga but had never lost his love for the C-64. He sold the Amiga to buy a PC, then discovered CMD. After assuring him that CMD is dedicated to supporting the Commodore 8-bit computer, he is returning to his first love.

There has never been any doubt among Europeans that the "breadbox"—as it is affectionately referred to here—is one of, if not the greatest computer ever assembled. The number of units sold here speaks for itself. I was in East Berlin at the time the Berlin Wall came down and experienced the frenzy of East Germans trying to get their hands on the computer that they had heard about for years but were never able to own: the C-64. Today, one can still purchase a C-64 in most of the larger European department stores and through mail order companies at a fraction of the cost I paid for mine some ten years ago. Insiders report that Commodore has moved most of its 8-bit computers and accessories into the eastern European market and is doing quite well. This computer refuses to die!

The greatest problem with the Commodore C-64 and C-128 in Europe is the same one you face in the States. During the late 80's and early 90's most of the hardware and software companies jumped ship. Some of the companies that remained, raised and then dashed our hopes with promises of products that never made it past the drawing table. The longest running (over 100 monthly issues to date!) and best European magazine still supporting our computer—Markt & Technik's *64'er* magazine—currently boasts only about one dozen advertisers. About one half of which are actually producing hardware and software. It has become obvious to Commodore users that the only ones who were going to save their computer were those who use it. We have to support ourselves by writing some of our own programs, offering each other support (User Groups), and support those companies that continue to offer us support by purchasing legitimate copies of software and not pirating software for our friends.

I don't know a single Commodore user that doesn't have at least one extra Commodore stashed in the closet somewhere—just in case something happens. European computer users tend to be more technically oriented and usually have some experience with a soldering iron or have a friend who knows their way around the inside of the "breadbox" if a repair becomes necessary. I personally own a 128-D, C-64 with 1541, an SX-64 and enough spare parts to open a Commodore service center. I've had kids show up at my doorstep with everything from broken joysticks to burned out power supplies. Don't get me wrong: Parts and chips are still readily available in Germany, but they cost as much now as they did 8 years ago. If you burn out 3 chips, you might as well buy a new computer and use the old one for replacement parts!!

C-64 and C-128 users in Europe belong to a special type of family and have a different kind of mentality. Loyalty runs high in our ranks and we take our computer very seriously! Members of user groups go into mourning and have been seen wearing sackcloth and ashes after learning that one of their own has sold his computer and has gone "the way of the wicked" (He bought a PC!). A good friend in Vienna gets a big kick out of bring his C-128 with RAMLink and FD-4000 to work, showing off what it can do and making fun of his colleagues who all work on a PC. There is even a GEOS club in Switzerland that refuses club membership to those who own the PC version of GEOS. Club meetings are usually intense social gatherings centered around our computer. A Gasthaus (German Restaurant) will offer the group one of their rooms for the day as long as the group eats their dinner there. Some of these meetings last for several days and even require reservations. Many of the users travel several hundred miles to take part in workshops lasting only a few hours. Everyone comes to learn, share, debate and generally soak in as much as possible. It is this kind of enthusiasm and participation that has given the European market its reputation for being a hot bed of activity.

It is the purpose of Foreign Exchange to introduce you to European C-64 users, their ideas, their problems and their programs. We will be looking at the different products that are available in the European market and also interview some of the brightest European programming minds. CW

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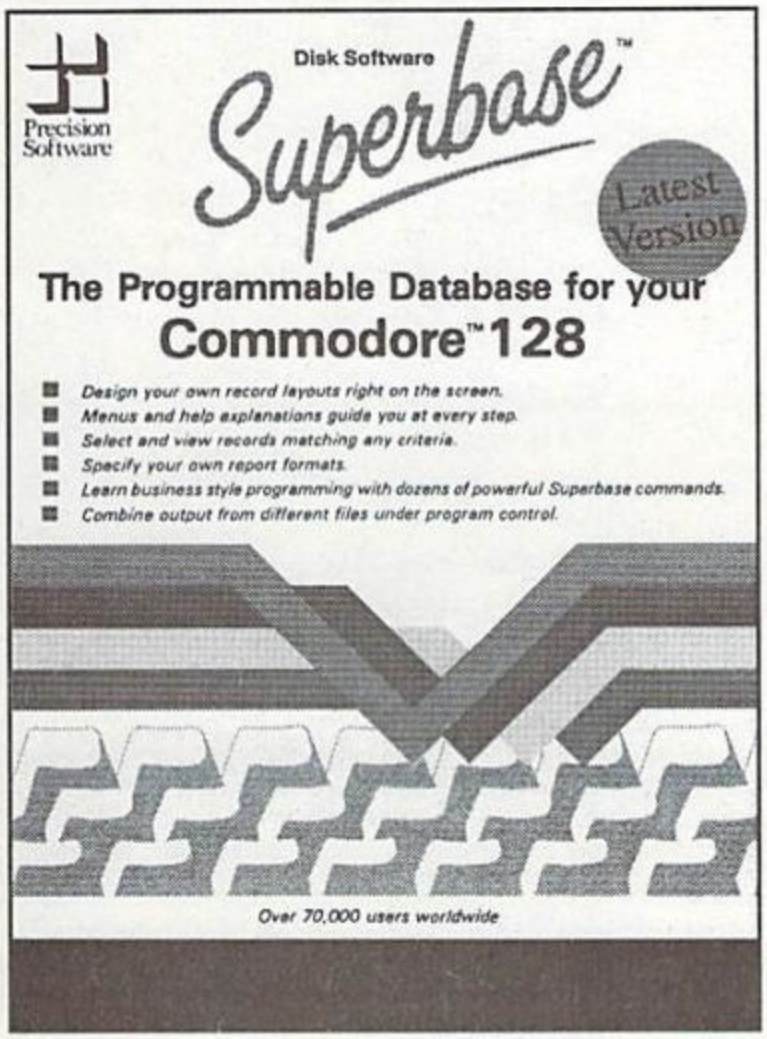
THE MOST POWERFUL DATABASE EVER DEVELOPED FOR THE C-64 AND C-128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Over 70,000 users worldwide

SuperBase 64/128

For years, Superbase has been the most powerful database system available for Commodore 8-bit computers. Why? Because not only can you access its commands from menus, but you can also create your own custom Superbase applications using the built-in programming language. Superbase can also import and export data using standard sequential files for easy portability with other applications. Additionally, the C-128 version will load with, and pass Macro commands to, the SuperScript word processor to create a completely automated office system.

With its built-in programming language, Superbase is ideal for custom applications such as invoicing, inventory, Accounts Receivable, Accounts Payable or just about any task you can think of. Superbase version 3.01 is available on 5.25" or 3.5" disk formats, making it ideal for use with CMD's FD-2000, FD-4000 and Commodore 1581 3.5" disk drives, CMD Hard Drives and RAMLink.

So if you've been looking for a powerful, easy-to-use, programmable database - look no further! Superbase is back and ready to tackle the toughest job of all - keeping you organized!

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SuperScript has everything your looking for in a professional word processor. Its menu driven command structure is easy-to-use and eliminates the need for complicated commands. SuperScript includes professional style editing, spell checking, calculator, row and column arithmetic and full mail merge facilities. The phrase glossary allows you to store entire passages of text or Macro commands and recall them with a key stroke.

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User Group Connection

SUPPORT YOUR LOCAL USER GROUP

Alaska

Sitka Commodore User's Group
PO Box 2204
Sitka, AK 99835

Anchorage C. U. G.
PO Box 104615
Anchorage, AK 99510-4615

Alabama

H.A.C.K.S.
PO Box 14356
Huntsville, AL 35815

Arizona

Busy-Bee User Group
2634 East Malvern Street
Tucson, AZ 85716

California

Lake County Computer Users
7827 Evergreen Drive
Kelseyville, CA 95451

Commodore 64 West Users Group
2306 W. 180th Street
Torrance, CA 90504

Southern California C.U.G.
2059 Cedar Ave., #11
Long Beach, CA 90806-4616

Orange County Commodore Club
c/o Bill Fox
4939 Dunrobin Ave.
Lakewood, CA 90713-1836

FUNHUG
814 Valley Run
Hercules, CA 94547-1440

Sacremento C.C.C.
P.O. Box 13393
Sacremento, CA 95813-3393

Hub Area Commodore Club
7127 Arrowhead Trail
Browns Valley, CA 95918-9630

Colorado

Front Range Commodore Club
PO Box 272
Niwot, CO 80544

Connecticut

Capit0l Region C.C.C.
P.O. Box 2372
Vernon, CT 06066

Fairfield County C.U.G.
P.O. Box 212
Danbury, CT 06813

Delaware

First State Commodore Club
PO Box 1313
Dover, DE 19903

Florida

Sun Coast Commodore Club
c/o Frank Galler
7034 Mayfield Drive
Port Richey, FL 34668

Gainesville C.U.G.
PO Box 90212
Gainesville, FL 32607

Titusville Commodore Club
890 Alford Street
Titusville, FL 32796

M.I.C.E.
11110 Bird Road
Miami, FL 33165

Tampa Commodore User's Group
PO Box 27141
Tampa, FL 33688

Commodore User's Group of Venice
PO Box 3325
Venice, FL 34293

Illinois

S.W.R.A.P. User's Group
PO Box 342
Bedford Park, IL 60499

East Side Computer Club
P.O. Box 276
Godfrey, IL 62035-0276

Fox Valley 64 User's Group
PO Box 28
North Aurora, IL 60542

Meeting 64/128 Users Thru the Mail
Rt. 1, Box 151
St. Joseph, IL 61873

Kentucky

L.U.C.KY
PO Box 19032
Louisville, KY 40219-0032

Maryland

ABCUG
PO Box 179
Glen Burnie, MD 21060-0179

A.C.U.G.
PO Box 3358
Annapolis, MD 21403

Massachusetts

Boston Computer Society - C= SIG
One Center Plaza
Boston, MA 02108

Pioneer Valley Commodore Club
6 Laurel Terrace
Westfield, MA 01085

Commodore Club of the Berkshires
38 Walden Lane
Pittsfield, MA 01201

Michigan

Computer Users of Lexington
P.O. Box 482
Lexington, MI 48450-0482

Saginaw Area C.U.G.
P.O. Box 2393
Sagnaw, MI 48605

Lansing Area Commodore Club
PO Box 1065
E. Lansing, MI 48826

Missouri

MDC/RCC - Commodore SIG
P.O. Box 1171 Carr Station
Florissant, MO 63031

CUGSL
c/o 129 Aokay Drive, Apt. K
St. Charles, MO 63301

Computers North Users Group
P.O. Box 34534
North Kansas City, MO 64116

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New Hampshire

Manchester C.U.G.
PO Box 1641
Manchester, NH 03105

New Jersey

Info 64 Users Group
c/o 186 Delmar Avenue
Glen Rock, NJ 07452

C.E.B.U.G
PO Box 314
East Brunswick, NJ 08816

New York

Mohawk Valley C.U.G.
P.O. Box 343
Tribes Hill, NY 12177

Bronx User's Group
PO Box 523
Bronx, NY 10475

Queens C.U.G.
P.O. Box 129
Queens, NY 11417

Hudson Valley Commodore Club
PO Box 2190
Kingston, NY 12041

Tri-City Commodore User's Group
PO Box 12742
Albany, NY 12212

Ohio

Central Ohio C.U.G.
P.O. Box 28229
Columbus, OH 43228-0229

Commodore Club of Central Ohio
PO Box 292392
Columbus, OH 43229

Commodore Club of Toledo
PO Box 13011
Toledo, OH 43613

Basic Bits Commodore Group
PO Box 81886
Cleveland, OH 44181-0886

Erie Bay C.U.G.
P.O. Box 1461
Sandusky, OH 44870

Shelby C.U.G.
P.O. Box 512
Shelby, OH 44875

Oklahoma

Commodore User's Group of Lawton
PO Box 3392
Lawton, OK 73502

Oregon

Commodore User's Association
PO Box 84
Medford, OR 97501

Pennsylvania

Pittsburgh Commodore Group
PO Box 16126
Pittsburgh, PA 15242

Harrisburg Area Computer Club
721 S. 29th St.
Harrisburg, PA 17111

Scranton C.U.G.
PO Box 244
Scranton, PA 18501

Main Line C.U.G.
1046 General Allen Ln.
West Chester, PA 19382

Philadelphia Area Computer Society
c/o LaSalle University
Philadelphia, PA 19141

South Carolina

River Rats User Group
P.O. Box 1036
Bath, SC 29816-6610

South Dakota

Sioux Empire Commodore Club
1932 South Menlo Ave.
Sioux Falls, SD 57105-2717

Tennessee

Memphis Commodore User Club
PO Box 34095
Memphis, TN 38134

Texas

C.U.S.A.T.
PO Box 380732
San Antonio, TX 78280

Utah

Mountain Computer Society
c/o 3898 Cheryl St.
Salt Lake City, UT 84119

Vermont

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6 Mayfair St.
S. Burlington, VT 05043

Virginia

Fredericksburg Commodore Club
6803 Teal Court
Spotsylvania, VA 22553

Peninsula C.U.G.
P.O. Box 11293
Newport News, VA 23601-9293

Capitol Area Commodore Enthusiasts
607 Abbotts Lane
Falls Church, VA 22046

Washington

Tri-City Commodore Computer Club
P.O. Box 224
Richland, WA 99352

Commodore Users Of Puget Sound
1706 Crestview Drive
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Attention User Groups!

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Top Tips

By Tim Walsh

A RENOWNED COMMODORE EXPERT SHARES HIS INSIGHTS

For many years, I've helped countless numbers of Commodore users troubleshoot their Commodore 64/128s over phone, at computer trade shows, and through on-line gatherings. I spent most of my seven-year tenure at RUN Magazine compiling the Magic column—a series of reader- and staff-submitted hints, tips, and techniques designed to make using your Commodore more fun and enjoyable, and extend its life well into the 21st century.

Starting with this premier issue of *Commodore World*, I'd like to continue that exciting tradition. Think of this as YOUR column, where we seek to publish the very best reader-submitted hints, tips, and techniques that allow you to get the most out of your Commodore.

Never one to mince words, here's my top-ten Do's and Don'ts list:

1. *DO* get in the habit of using your 64/128 more. It's no secret; the more you use the computer for everyday tasks (printing grocery lists, mailing labels, balancing your checkbook, and so on), the more computer-savvy you'll become.

2. *DON'T* give your vintage Plus/4 or Vic-20 the heave-ho: Many schools and civic organizations gladly accept computer equipment. Old hardware, software, disks, books, and assorted computer reference material that's outdated by your standards may be precious to others.

3. *DO* get a modem, telecommunication software, and a network account. GEnie, CompuServe, and BIX represent three mainstream, low-cost networks that provide

support areas and forums for the 64/128. Your Commodore offers plenty of potential—many non-platform-specific forums on CompuServe (the General Motors of computer networks) keep the needs of timeworn computer models in mind. Consequently, they don't permit file compression techniques not supported by the Tandy 100 or Model III—computers more elderly than the 64/128!

Services such as GEnie's CALC (Computer-Assisted Learning Center) let you attend classes from your Commodore and even work towards an associate's degree. If you're interested about the much-ballyhooed Information Superhighway, your modem serves as an on-ramp that takes you onto the open roads of BIX, Portal, and Delphi, three nets that offer direct access to both the Internet and its subsystem, Usenet.

No single activity perpetuates the life of your Commodore quite as well. Remember: the mightiest Mac, Amiga, or PC is no quicker than your C-64/128 at sending or receiving data at any given baud rate.

4. *DON'T* send program or text files through on-line services without first compressing them. Get in the habit of compressing your files before e-mailing or transmitting them through the modem. For one of the easiest Commodore-compatible archiving programs, get VSD Maker v3.0 (Vision Self Dissolve Maker), an aggressively supported file-archiving system.

If you download (retrieve) text files from BBSs and networks, you'll save considerable time and money with a copy of UNZIP.SFX. Regardless of the originating platform, this self-extracting archive dissolves text files created with PKZip 1.10 on your Commodore. Another Basic program found in public domain circles, LZHSFX.SFX, converts .LZH files (files compressed with the popular PC/Amiga program LHarc) into Commodore-compatible .SFX files.

5. *DO* routinely back up all your important word processor, database, and graphic files on floppies. Speaking from experience, large capacity devices such as one of CMD's hard drives make it all too easy to forget good file maintenance and archiving practices.

6. *DON'T* shy away from learning to program your C-64/128. Books on programming the 64/128 may be out of print, are still widely available. Commodore 64 Assembly Language by W. Douglas Maurer (Computer Science Press, ISBN 0-88175-040-9) and Programming the

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Commodore 64 (Compute! Books, ISBN 0-942386-50-7) are two reference guides I highly recommend. With a foundation based on Basic programming, you'll be able to master other programming languages quickly.

7. *DO* get a database program. Of all the programs I've used over the years, none offered more long-term benefits. I now keep all manner of lists on a database. If I need to call a company, contact an author, look up a product, or whatever, the information is merely a mouse-click or three away. When I need to generate mailing labels, a database lets me selectively print only those I need.

8. *DON'T* rely solely on your memory and disk directories to keep track of files and programs. Besides making backups on floppies whenever possible, get several large-capacity three-ring binders, a paper punch, and make printouts of your disk directories, lists, and important text files and file them in the binders. The advantages are two-fold: you'll have reference material at your fingertips and a hardcopy in the unlikely event your computer goes down for the count. Attach important files as e-mail to your on-line accounts for really important, secure (but short-term) backups.

9. *DO* form or join a Commodore users group. Direct interaction with well-intentioned, knowledgeable computerists still remains the best method of sharing information and getting help.

10. *DON'T* be quick to abandon your Commodore 64/128 if you decide to upgrade to a bigger, faster computer. Continue to use your Commodore to compliment the new machine, perhaps as a dedicated telecommunications computer for operating a BBS.

As many professional computer users expand their hardware and software arsenal with large chunks of their disposable income, keep in mind you're experiencing the best that computing has to offer without spending thousands of dollars in software and hardware. So, take that money and invest in something REALLY fun—like dream vacations or a personal watercraft! **CW**

Tim Walsh is Senior Editor of AmigaWorld, *the world's highest-circulation Commodore-Amiga publication.*

TOP TIPS Needs Your Input!

Each issue we'll print the very best tips we receive from our readers. One of these will also be chosen as the top tip of the issue, and the contributor will receive a special bonus from Commodore World. Send us your tips on using and programming your Commodore 64 or 128, and you may just be the one to get honored as the contributor of Commodore World's Top Tip! Send your tips to:

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Just For Starters

by Steve Vander Ark

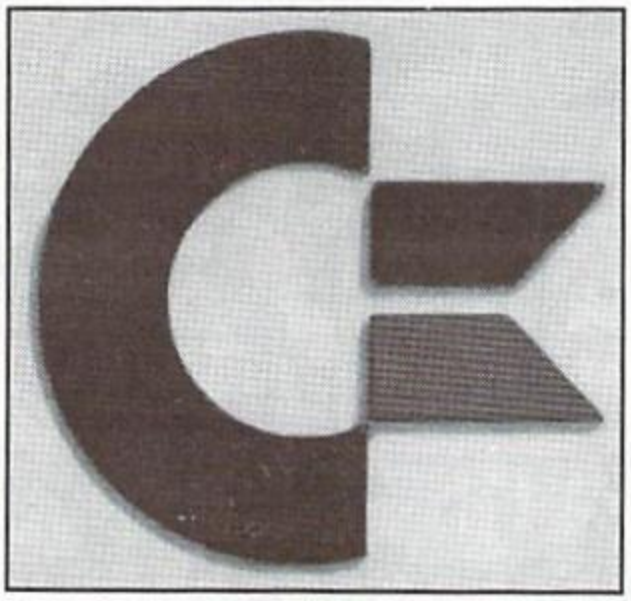
FOR USERS JUST GETTING STARTED IN COMMODORE COMPUTING

My computer can talk. It talks a lot. Constantly, as a matter of fact.

Oh, I don't mean that it actually says words like "Please pass the salt" or "You can't cram that pan into the dishwasher, it's full" or "Why are you eating another snack just before dinner," although my 128 can actually talk like that too, given the right software. No, I mean the kind of talking that every computer does all the time, to itself and to its peripherals, (which is a high-falutin' word for all the gizmos you plug into and use with the computer itself, such as printers and disk drives).

Every computer needs to be able to do this kind of talking. After all, a disk drive wouldn't be much use if a computer couldn't get any information from it. (I have several drives in exactly that condition—completely mute—and I can assure you that they are about as useful as a pothole.) So the upshot of all this is that any computer needs to talk all the time, and the Commodore 64 and 128 are particularly good at it.

Now the world at large is fond of one certain language for all this computer talking, the one called MS-DOS. That's the one used by all those IBM compatible computers out there. There are languages, such as Pro-DOS for the Apple, but MS-DOS is by far the most common. The "MS" stands for MicroSoft, the behemoth company also guilty of creating Windows, and "DOS" stands for "disk operating system," so called because it is loaded from a disk every time you start up your computer after which it cheerfully operates your system—talks to itself and your peripherals, in other words.



You might wonder where the DOS disk is for your Commodore. After all, I did say that the 64 and 128 were particularly good at all this talking back and forth, so it must have a really cool DOS, right? Nope. No disk. You see, your Commodore comes with the language built right in, ready and waiting when you flip on the switch. That means it isn't really a "DOS" at all, it's an "OS," just an operating system. (There is a DOS for the Commodore, by the way. It's called GEOS, "Graphic Environment Operating System," and it is superb. But that's another column...) So what does this built-in operating system do for the average user like you? Well, it operates your system, of course, but it does more than that. It knows enough to actually talk to you too. Don't believe it? Check out the message that appears when you turn on your machine. After all the copyright information that no one ever really reads, the operating system tells you in a nice, friendly way that you can get started: it says "READY" and blinks at you, waiting for your response. (That little blinking thing is called the "cursor," by the way.) You can think of the cursor as showing you where on the screen the computer is looking at any particular moment; right after you start up your machine it's looking at that blinking spot, waiting for you to type in some kind of instructions.

You see, the Commodore computer includes a whole raft of commands that you can use, both for the operating system itself and for a separate language called BASIC. That other language is also built right into your 64 or 128, giving you all sorts of powerful options. As a matter of fact, most of your communication with your computer will be in the form of BASIC commands, commands which will in turn talk to your computer and give the orders.

That's really not so different from the kind of "out loud" talking I mentioned a few minutes ago. Think about it: when you need some salt for your french fries, you say "Please pass the salt." When we want our word processor to run on our Commodore, we say "Please load the program called WORD PROCESSOR and run it." We do this by typing the words when we see the little blinking cursor. Then we press the RETURN key to send the request to the computer to carry out. It's really very simple: we type the instructions, the computer carries them out.

Before we try this, though, I had better clarify something: the computer might be great at talking to itself and at taking typed instructions but it doesn't know how to do

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"My computer can talk. It talks a lot. Constantly, as a matter of fact."

it in English. That "Please load the program" bit won't cut it. That was English. If we try to talk to our computer that way it will respond with SYNTAX ERROR, which is its very polite and stuffy way of saying that it hasn't a clue as to what we mean.

Instead, we'll have to learn to talk in a language the computer does understand. I mentioned before that your 64 and 128 come with the BASIC language built right in, so let's learn how to say "Please load the program called WORD PROCESSOR and run it" in BASIC. That isn't really as tough to do as you might think, since BASIC actually uses a lot of English words. To load a program, for example, we type LOAD. If we just type LOAD and press the RETURN key, though, the computer will still be baffled, since we never told it what to load. So after LOAD we'll type the name of the program we want loaded, in this case WORD PROCESSOR. Computers, however, are very unimaginative and literal in their thinking (kind of dumb in other words) and if we just type in the name, the computer would assume it was a whole new command. To keep things clear for the computer, then, we'll put quotation marks around our program name. When we're done, we've produced a line that says LOAD "WORD PROCESSOR."

Now before we press RETURN, let me digress here for a minute. The Commodore 64 was produced way back in the early 80's, at which time it was a revolutionary, state of the art machine. It had features that no other personal computer had and at the ridiculously low price of less than a thousand dollars. Back then, when MicroSoft was barely out of diapers and IBM thought only businesses would ever really use computers, most computers used a device called a tape drive (which is computer-ese for tape recorder) to store information. Big computers at places like the Pentagon used big hulking tape drives (the kind you see whirling away in the background in old movies) and Commodore 64 computers used little Commodore tape drives. Oh, someone had invented a floppy disk drive, sure, but the price was only a little less than the price of a compact car, so Commodore figured no one would ever want one. The version of BASIC they built into their computers, then, assumed that everyone was using a tape drive.

So far so good. But chances are you aren't using a tape drive at all. Very few people do anymore. Unfortunately a Commodore 64 or 128 doesn't know that. So when we typed our LOAD "WORD PROCESSOR" sentence a few minutes ago, we were telling the computer to load from a tape drive. If we just say LOAD, that's what the 64 and 128 assume. There is a way around that, of course. We just need to add something to what we type to tell the computer to look somewhere else for the program, to tell it to look at our disk drive. We could try this: LOAD "WORD PROCESSOR" AND USE THE DISK DRIVE PLEASE, but as you might expect, that's the wrong language. We need to find out how BASIC lets us say "Use the disk drive please."

Fortunately, the people who designed the 64 and 128 made that part easy. They knew that their computer would need to chat back and forth between various peripherals, so they gave each peripheral a number. It works sort of like a street address. If the computer needs to talk to the printer, for example, it addresses what it says to device number 4. The tape drive is number 1. The disk drive is number 8. (If you have more than one drive, they're numbered 9, 10, and so on, but for now let's stick with number 8). So if we want the computer to look for our WORD PROCESSOR program on our disk drive, we need to tell it to look at device number 8. Here's how BASIC lets us do that: LOAD "WORD PROCESSOR",8. See how nifty that works?

BASIC commands often need extra bits of information to do their job, just like our LOAD command needed the 8 after it to know where to load from. These are called "parameters," and they are often numbers. Generally speaking, you separate parameters from the command and from each other with commas. Sometimes these parameters give an address, just like the 8 did in our LOAD command.

Other times, they signal to the computer to do things in a certain way. The LOAD command actually knows two ways of loading a program. BASIC assumes one way, which is what we just asked for when we typed LOAD "WORD PROCESSOR",8. To ask for the other method of loading, we add one more parameter to the end of the LOAD command, a number 1. The command then looks like this: LOAD "WORD PROCESSOR",8,1.

Some programs need one kind of LOAD command, some need the other kind. The best way to tell which one you need to use is to check the documentation that came with the program you're trying to load. If you aren't sure, try it both ways. Don't worry, you won't break anything if you choose the wrong one.

The BASIC language built into a Commodore gives you, the user, the power to talk to your computer, telling it to do many things, a lot more than just load programs. There are ways that your computer talks back to you as well, such as the READY message when it's all set for you to use. Next month We'll talk some more about some of the ways you and your computer can communicate. **CW**

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PRINTERS & INTERFACES

Which Ones Are Right For You?

Printing is, without question, the most important function of using a personal computer for nearly every user. Whether you use your computer for word processing, graphics creation, database or spreadsheet applications or even programming, you need reliable output on paper. The 'vision' of a paperless society is still just exactly that – a vision, not a reality.

With this important fact in mind, we at *Commodore World* have compiled the information we feel is most important in making a proper printer selection for your own specific needs. And because today's printers are not 'Commodore-ready', we've naturally supplied additional information on the interfacing devices and methods available to you.

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Which Type is Your Type?

Gone are the days when you simply had to choose between two or more dot-matrix printers. Today we have a wide range of printer types to choose from, all with their own benefits and shortcomings. Each of the technologies currently employed in modern printers brings with it a certain level of quality. In turn, each also has an initial cost and a maintenance cost. All of these factors should be weighed when considering a new purchase to avoid any 'surprises' down the road.

The descriptions of printer types given in the following paragraphs will help illustrate the quality and cost factors involved with each. Also, take note of compatibility issues, since compatibility with your software is of utmost importance.

Dot-Matrix Printers

While industry analysts have been saying for years that dot-matrix printer sales would soon drop off in favor of newer technologies, these old workhorses still accounted for 50 percent of printer sales in 1993. It's easy to understand why the decline has been slow; dot-matrix printers are inexpensive to buy and operate, and are well suited for a wide range of applications. Wide paper or multi-part forms printing will generally dictate the use of these types of printers.

For the Commodore user, dot-matrix printers make the best choice for general use. With 9-pin models selling in the $150 to $300 range, and 24-pin models going for $200 to $500, you should be able to easily find a model that suits both your needs and your wallet.

With print-head life expectancy of around 100 million characters, a dot matrix printer will last years for the average user. These printers continue to be bargains long after your purchase, with operating costs of under a penny a page.

Operating speeds are typically in the range of 25 to 250 characters per second, but you can expect much slower throughput when printing graphics or using NLQ and Quiet modes. This latter feature found on some models brings to light an important side-effect of dot-matrix printing: it's loud. Slight improvements have been made in this area over the years, but even Quiet modes won't have that much of an effect on the overall sound level. Speed, too, has improved only marginally over past models, even with built-in buffering; much of this is probably due to the much wider use of graphical printing in applications.

Speaking of graphical printing, all dot matrix printers today offer standard resolutions up to 216 by 240 dots per inch on 9-pin models, and 360 by 360 dots per inch on 24-pin models. Most applications on Commodore computers will only use older standards of 72 by 80 dots per inch, but a few have double- and quadruple-strike drivers; while some GEOS printer drivers can actually address other resolutions directly. Perfect Print for GEOS can make full use of the maximum resolution of these printers.

Most modern dot-matrix printers also come supplied with a few fonts. Three to five built-in fonts appears to be what you can expect. Some models also have scalable fonts, but these are generally not of much use with programs available for your computer. A Near-Letter-Quality mode is considered standard as well, and it's unlikely you'll find a modern printer without one.

The main question on the mind of most Commodore users when looking for a new printer is compatibility. And the good news is that most any 9- or 24-pin printer available today will work with most, if not all, of your applications. Part of this will depend somewhat on making sure that you use an interface with an acceptable 1525 emulation for applications which do not support the Epson FX-80, Epson LQ-850, or IBM Proprinter X24 emulations available on practically every new printer being manufactured today. Some older programs which offer support for Epson printers only work with Epson MX-80 printers; however, these applications can be made to work using the advice given in the sidebar, "Old Software & New Printers".

One area where compatibility will indeed be a problem is with color printing. Most Commodore applications which have the ability to print in color only support some very old printer types. Specifically, you won't find a modern color printer that emulates the color codes used on the Okidata Okimate series printers, or even the Epson JX-80. GEOS users, however, will find that a color driver is available to them for use with new 24-pin color printers. This driver, EPSON24PINCOLOR, is available on GEnie or can be obtained directly from CMD (currently the distributor of GEOS).

As we've mentioned, dot-matrix printers make a good choice. Our recommendation would be to go with a 24-pin model, with or without color (bearing in mind the limitation mentioned above). Skip fancy extras like scalable fonts. The printer should have LQ-850 and IBM Proprinter X24 emulation modes at the very minimum. You should also make sure that AGM can be turned off easily (see the "Old Software & New Printers" sidebar for details on what this is and why you would want to switch it off). Avoid printers which can only be configured using a supplied program (you can bet it isn't supplied in a Commodore format). Printers that use front panel controls for configuration are fine, but bear in mind that it will take some time to become familiar with making changes on these models.

Type quality at a glance...

Each printer type offers a level of quality which is generally commensurate with its cost. As the price you pay for a printer goes up, so too does the quality available from the printer. The magnified output samples shown below should give you a general idea of the kind of quality you can expect with a specific printer type.

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Ink Jet Printers

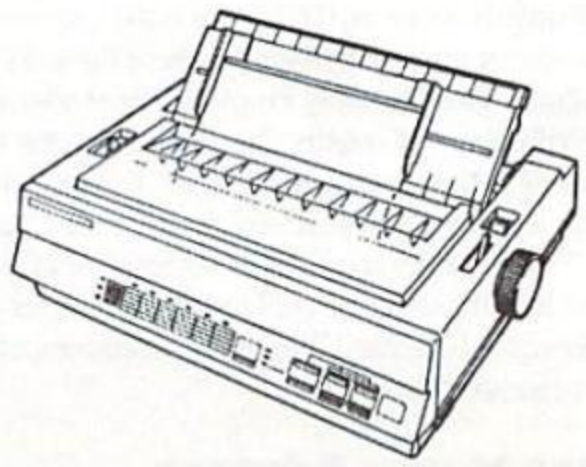
Many improvements have been made in this fairly new printer technology in recent years, and ink jet printers are now an inexpensive alternative. These printers deliver output which is a definite improvement over dot-matrix types, and both their output quality and price place them squarely between dot-matrix and laser printers. Improved quality and lower prices have caused substantial growth in the ink jet printer market, and experts seem to agree that these kinds of printers will own the lion's share of the market by 1996.

Most ink jet printers use a thermal process, heating ink stored in a cavity until it expands. This expansion eventually causes the ink to be 'sprayed' from the nozzles on the print head. This method tends to cause small stray particles of ink, dubbed *satellites*, to end up in places other than intended. One new contender, the Epson Stylus 800, departs from the thermal method. Instead of heating the ink to force expansion, the Stylus 800 charges a piezo material cavity, causing it to change shape and force the ink out. This approach appears to cause less problems with satellites, giving the Epson Stylus 800 a clear advantage over the competition when it comes to crisp text and cleaner looking output.

On the whole, ink jet printers are far less expensive than laser printers in initial outlay; the normal price range being from under $300 up to around $700. However, the average operating cost of 6 cents per page is double that of laser printers. Popular low-cost models tend to cost even more to operate, with the Cannon BJ series coming in at 8.9 cents per page.

Speed on most models is also slow, falling into a range from 30 to 100 characters per second. However, printing is very quiet as compared with other printing technologies, and ink jets are the most energy-efficient types of printers in common use today.

Paper-handling on ink jet printers is limited to single sheets, so they won't make a good choice for multi-part business forms. Most come supplied with a cut-sheet feed tray, and many also have a manual feed option for single



sheets. Some models even handle large formats; the Cannon BJ-230, for example, can print on stock up to 11 by 17 inches. Ink jet printers also do a superb job with transparancies. For best results, non-porous printing stock should be used for all printing.

Printing resolution, built-in fonts, and emulation modes in ink jet printers all tend to fall into the same guidelines discussed previously for dot-matrix printers. However, there are some exceptions. Some models contain substantially more fonts; others (such as HP's models) have non-standard print densities and emulations.

Some of the reported problems with ink jet printers are that output will easily smear or smudge. This condition has been improving, but you should be aware that output needs to be handled carefully until it is completely dry. These printers do not make a good choice for mailing labels, since getting the output wet could result in unreadable results. The problem with satellites also becomes somewhat pronounced when printing graphics, giving the appearance that some areas have a little too much ink.

Our recommendation for ink jet printers would be to stick with what has been tried and proven. The Cannon BJ series and Epson Stylus models have been tried by a number of Commodore users with good success. These models offer good emulation of standard dot-matrix printers, and the emulations are so good that even dot-matrix specific programs such as Perfect Print work on them. Again, let the "Old Software & New Printers" sidebar be your guide to obtaining compatibility with old programs.

Old Software & New Printers

New printers should have no problem working with many of your old text-based printing applications. Simple word processors and spreadsheets simply send ASCII or PETASCII codes to the printer, and since these standards have not changed, your new printer should work well.

GEOS users will also find that there are printer drivers available for them to make use of 24-pin printers. The Epson LQ-1500 and Star NB-15 printer drivers should handle most any 24-pin printer. Further improvements may be realized by using Perfect Print, the printing application for GEOS available from CMD, SSI, and other dealers.

Some graphic-based applications, however, may have difficulty printing in the proper perspective on modern 24-pin printers. The effect will be a page that prints longer than normal in the vertical direction. There are two fairly simple work-arounds which you can try to resolve this problem.

If your application has an IBM printer driver selection, place your printer into its IBM Proprinter X24 emulation mode. If your printer is equipped with AGM (Advanced Graphics Mode), disable that feature. Often, this will be enough to correct the problem. If it isn't, however, try entering the following BASIC lines before starting your application:

```
OPEN4,4
PRINT#4,CHR$(27);CHR$(65);CHR$(8)
PRINT#4,CHR$(27);CHR$(50);
CLOSE4
```

These lines will help your printer to work with drivers intended for Epson MX-80 printers. It has been report that this works well with Print Shop and other early applications with Epson MX-80 drivers.

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Laser Printers

Prices on laser printers have been steadily dropping for years now, and 300 dot per inch models are well within the reach of many users in search of high quality output. In fact, prices have dropped to nearly one-tenth of what they were five or six years ago. With prices this low, and quality levels exceeding other printer types, you should carefully consider whether a laser printer will fit your application and budget.

Laser printers with 300 dot per inch resolution can now be found in the $500 to $1000 range. A far cry from the $6000 our company paid for a similar printer some six years ago. That printer, by the way, is still going strong and churning out decent quality pages on a daily basis. But wait! Not only are the current crop of 300 dpi lasers available at reasonable prices, but even their 600 dpi counterparts are now within easy reach for many serious users. Apple, HP, and others have placed 600 dpi models in the $1500 retail range, and some shopping around will show that street prices of around $1300 aren't hard to find.

Laser printers are fairly cheap to operate, with an average cost of around 3 cents a page. Text output is crisp and clear, though graphics will likely suffer somewhat if printed using an emulation mode. This situation with graphics comes back to our age-old problem: software which isn't capable of taking full advantage of the new hardware. Programs like Perfect Print for GEOS won't help in this case, either, due to the way most laser printer emulation modes operate.

GEOS users will want to opt for a laser printer with built-in Postscript, a page description language developed by Adobe. Printers equipped with this interpreter cost a little more than printers without it, but it's very nearly considered a requirement for laser printer use under GEOS. The HP 4L, a 4 page per minute model with Postscript can be purchased for around $650 from a number of sources.

GEOS users will also want to look into some enhancements to allow them to make better use of a laser printer. The Laserwriter 2.1 printer driver supplied with GEOS for use with postscript printers requires an RS-232 interface; such interfaces are now very difficult to find, and many of the current crop of laser printers don't have RS-232 ports. To resolve this issue, pick up a Skyles Parallel Printer Cable (GEOCABLE equivalent). This cable now comes supplied with a GEOCABLE version of the Laserwriter driver when purchased direct from CMD. Consider getting Collette Utilities at the same time, since it provides a patch to allow GEOPUBLASER to use a GEOCABLE. This handy utilities disk also contains a Postscript pre-processor for printing pages in landscape (sideways) mode with GEOPUBLASER. Other Postscript tricks are also possible with this utility if you're brave enough to experiment. Finally, Group M MultiMedia has just announced a collection of Postscript clip art for use with GEOS (see inside front cover of this issue for details).

If you only use GEOS part of the time, and wish to use a laser printer for both GEOS and non-GEOS printing applications, you'll need a printer with both Postscript and an Epson FX-80 or Epson LQ-850 emulation mode.

If you don't use GEOS at all, and have no plans to do so in the future, then skip the added

Laser Printers for Commodore Users

A wide selection of laser printers are available today in a wide range of prices. Some of these simply are not good choices for Commodore users, however, due to a lack of certain emulation modes. Here is a breakdown of currently available models which make good choices for your system. Prices given are retail; street price may be substantially lower, and is generally at least $100 less than shown. GEOS users will require Postscript (PS or PS2), while other applications require Epson FX (FX) emulation.

Printer Model	Speed	Res.	Printer Emulations	Price
Apple LaserWriter Select 310	4 ppm	300 dpi	PS	$1079
Apple LaserWriter Select 360	10 ppm	600 dpi	PCL5,PS2	$1499
Apple LaserWriter Pro 630	8 ppm	600 dpi	PCL4,PS2	$2529
Brother Laser Printer HL-6	6 ppm	300 dpi	FX,IBM,PCL	$895
Brother Laser Printer HL-10h	10 ppm	600 dpi	FX,IBM,D6,PCL,PS	$1549
Citizen ProLaser 6000	6 ppm	300 dpi	FX,IBM,PCL	$849
Epson ActionLaser 1000	6 ppm	300 dpi	FX,LQ,PCL,PS[1]	$799
Epson ActionLaser 1500	6 ppm	300 dpi	FX,LQ,PCL,GL2,PS[1]	$849
HP LaserJet 4ML	4 ppm	300 dpi	PCL,GL,PS	$1279
HP LaserJet 4MP	4 ppm	600 dpi	FX[2],IBM[2],PCL,GL,PS	$2399
HP LaserJet 4M	8 ppm	600 dpi	FX[2],IBM[2],PCL,GL,PS	$2399
IBM 4039 10R	10 ppm	600 dpi	PS,PCL	$1599
Okidata OL850	8 ppm	300 dpi	D6,PCL,PS	$1999
QMS 420 Print System	4 ppm	600 dpi	PCL,GL,PS,PS2	$1995
Samsung Finalé Hi-Res	8 ppm	1200 dpi	FX,IBM,PCL,PCL5,GL,PS	$2068
Sharp JX-9400	6 ppm	300 dpi	FX,IBM,D6,PCL	$599
Star Micronics LS-5EX	5 ppm	300 dpi	PCL,PCL5,GL,PS[3]	$989
Tandy LP410	4 ppm	300 dpi	FX,IBM,PCL,PCL5,PS[4]	$1099
Tandy LP800	8 ppm	300 dpi	FX,IBM,PCL,PCL5,PS[4]	$1499
TI microWriter	5 ppm	300 dpi	PCL,PS	$599
TI microLaser Pro 600	8 ppm	600 dpi	PCL,PS,PS2	$1599
Xante Accel-a-Writer 4000	4 ppm	600 dpi	PCL,PS	$1795

Note: All models listed here come with a parallel (Centronics) port
[1]Add $449 [2]Add $199 [3]Add $225 [4]Add $399.99 plus $399.99 for additional RAM

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cost of Postscript and go for a printer with Epson FX-80 emulation. See the "Laser Printers For Commodore Users" sidebar for a list of usable models.

New or Used?

One of the most important things you should consider when looking for a printer is whether you want to purchase a new or used printer. Naturally, a used printer is going to cost less, but may also be short-lived, slower, and produce lower-quality output. A used printer is a good choice for a second printer on your system; it can be used to check your output for formatting, or for printing listings and other applications which are not quality-sensitive.

If your software is strictly for Commodore compatible printers, you can get by with a Commodore or Commodore-ready printer. While you may have little trouble locating a used 1525, MPS-801, MPS-802, or other past models produced by Commodore, we recommend avoiding these in favor of a Star NX-1000C or Star NX-1000C Rainbow. Why? Because these latter printers are capable of full 1525 emulation *and* Epson FX-80 emulation (JX-80 in the case of the Rainbow version). This means you get more for your money, and it opens up new levels of quality for your printed output. Definitely avoid any other Commodore-compatible or Commodore printers for use with GEOS. GEOS was designed for 80 dpi printer output, and won't give you a full page width with Commodore-type 60 dpi printers.

New printers bring you some assurances, albeit at a higher cost. All new printers come with a warranty, and generally offer speedy high-quality printing, multiple fonts, and numerous other features and options. New printers are not, however, Commodore-ready; you'll have to purchase a printer interface to use any of these printers on a Commodore system. The flip-side of this shortcoming, however, is that these printers are completely ready to work on other types of computer systems. This may be important if you decide to buy another computer type in the future.

The Art of Interfacing

Interfacing your printer to your Commodore may seem confusing when you choose a printer that isn't specifically Commodore-ready; and there are no new printers that are. If you glance at the sidebar, "Printer Interfaces at a Glance", you'll note that there are a few different kinds of interfaces shown. The Xetec and Micro R & D interfaces are all listed as 'Serial Port to Centronics' types. This is the most common type of printer interface made for hooking up non-Commodore printers to your computer.

Features vary, but overall performance on interfaces which fall into this category is similar. Only the Xetec Super Graphix Gold model ever broke from this mold, as it had a fast serial burst capability. There are many other models besides those listed, such as the Xetec Super Graphix Gold, the Hotshot and Hotshot Plus from Omnitronix, and the Cardco A, B, G, G+ and G-Wiz (the latter two are now known as the Supra-G and Supra-G-Wiz). Most of these are found only in the used market now, though a few of the Supra models are still available. Even the Xetec interfaces are no longer made, and relatively few are available from any source we're aware of. The only interface of this type which we're aware of still being made is the MW-350. Since most programs bypass most of the interface options to deal directly with the interfaced printer, the selection of interfaces isn't as important as it once was when programs only supported printers that could emulate the Commodore 1525 or 1526 printers.

The Omnitronix Serial Printer Interface is listed as 'Serial Port to RS-232'. This is used with printers that are equipped with a 25-pin RS-232 serial port instead of a standard Centronics printer port. These printers are rare nowadays, as are the interfaces needed to use them. Avoid buying a used printer requiring an RS-232 interface unless you can first locate a source from which you can obtain the interface.

The last type shown, 'User Port to Centronics', is a GEOCABLE type of interface. This requires special drivers in order to work properly. A number of such drivers exist for GEOS, and this cable is compatible with a few other programs such as Superbase and Superscript. Most other programs do not support this cable at all. Why get one? It has an advantage in speed because it takes parallel data from the computer directly to the parallel port on the printer. All other interface types receive serial data only from the computer, and have to convert this to parallel data before sending it to the printer. The increase in speed can be especially beneficial on 24-pin printers.

Conclusion

Hopefully this article has given you a better working knowledge of what's available, and what works. As to what is best for you, your applications and wallet will have to decide.

CW

Printer Interfaces at a Glance...

Manufacturer	Micro R&D	Micro R&D	Xetec	Xetec	Omnitronix	Skyles
Model	Micrografix MW-302	Micrografix MW-350	Super Graphix Junior	Super Graphix Senior	Serial Printer Interface	Parallel Print Cable
Type	Serial Port to Centronics	Serial Port to Centronics	Serial Port to Centronics	Serial Port to Centronics	Serial Port to RS-232	User Port to Centronics
Buffer	N/A	Optional 10K	N/A	8K	N/A	N/A
Baud Rate	N/A	N/A	N/A	N/A	75 - 19200	N/A

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Power-Backed Expandable REU

The fastest possible form of storage, RAMLink provides instant access to files and retains data while your computer is turned off. Easy to use and expandable up to 16 MB, RAMLink utilizes the same powerful operating system found in CMD Hard Drives. Unlike Commodore REU's which are compatible with less than 1% of commercial software, RAMLink supports more than 80% of the commercial titles. RAMLink also offers built-in JiffyDOS Kernal, SWAP feature, reset button, enable/disable switch, pass-thru port and RAM port for REU/GEORAM use. RAMLink offers maximum speed, expandability and compatibility with all types of software and hardware including GEOS.

HDSeries

SCSI Hard Drive for the C-64/128

HD Series Hard Drives are available in capacities up to 1 GB, are fully partitionable, and can emulate 1541, 1571, & 1581 disks while Native partitions utilize MSDOS-style subdirectories. HD's connect easily to the serial bus or parallel via RAMLink. Includes built-in JiffyDOS, SWAP feature and RTC. HD's offer superior compatibility with most commercial software including BBS, Productivity and GEOS. And with new pricing, HD Series drives offer the lowest cost per megabyte of any C64/128 storage device.

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CMD Releases Revolutionary New Mouse

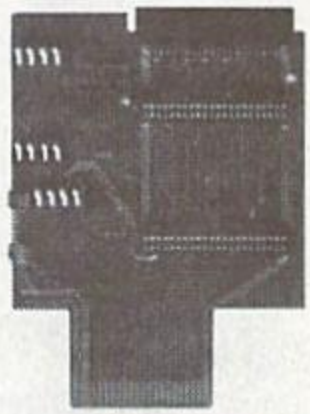
Hickory-Dickory-Dock, SmartMouse has got a Clock!

For years, Commodore set the standard with the 1351 Mouse. Now CMD has set a new standard with the SmartMouse. Guaranteed 100% 1351 compatible, the SmartMouse does everything the C-1351 does and more! This highly-intelligent, three button mouse includes a built-in battery-backed Real-Time Clock, and a double-click feature for GEOS. Plus, it comes with a complete set of utilities, including: Auto-exec for setting the GEOS clock, a utility for setting the mouse clock from GEOS, and BASIC utilities for setting the clock and displaying time and date on screen. In addition to new features, the SmartMouse's ergonomic design makes it lighter, smoother and smaller than its outdated counterpart. So, if your old mouse is losing the rat-race, get out of that trap with SmartMouse!

What Makes the SmartMouse the BEST C-64/128 Mouse Ever...

- Three buttons means convenience! If you're a GEOS user, the left button is configured as single click, the right as a handy double click and the center button is the TURBO button. When depressed, it doubles the speed at which the mouse moves across the screen. Additionally, programmers can assign their own functions to all three of the SmartMouse buttons.
- Unlike other third party mice, the CMD SmartMouse uses the same custom gate array chip as the Commodore C-1351 mouse. This guarantees 100% compatibility with existing software and hardware.
- Switches easily into joystick emulation mode on power-up by holding down the right button.
- SmartMouse utilizes the same advanced mouse technology used in today's powerful 486 and Pentium-based PC's, providing you with unparalleled accuracy and smoothness of operation.
- Built-in battery-backed Real-Time Clock automatically sets the GEOS clock, displays time and can be used in your own programs.
- SmartMouse is supplied with utilities disk and detailed manual explaining the utilities and programming information.
- Attention Lefties! You're going love the SmartMouse! With a simple modification outlined in the manual, you can alter the SmartMouse for left handed use. (Or for a small fee CMD will customize your mouse for you).
- Built-in Configuration RAM allows for future enhancements.

CMD 2+1 Cartridge Port Expander



Previously produced by Skyles Electric Works and recently acquired by CMD, the 2+1 Cartridge Port Expander provides two vertical and one horizontal expansion ports for the C64 and C128. Each port is equipped with four individual switches to control the +5, GAME, EXROM and ROML signal lines for utmost flexibility and compatibility. This tried and true system has been helping Commodore users get the most from their computers for years. For extra safety, the 2+1 is fuse protected and provides a convenient reset switch.

The 2+1 is great for using SwiftLink, SID Symphony, Super Snapshot, REU's, GEORAM or almost any other cartridge that you may have. By using the 2+1, you eliminate wear and tear on your computer's cartridge port caused by frequent use. Contact CMD for more information regarding compatibility and applications for the 2+1 cartridge.

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Best prices ever! Save up to $125

Includes: CMD HD, RAMLink, RAMCard w/RTC, 1 or 4 MB SIMM, RL Battery, Parallel Cable

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HD-245	w/ RL1	$875	w/ RL4	$1000
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Great Prices on Great Reference Materials

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QWKRR 128

Off-line QWK Mail Reader for the C-128

Version: 4.2
Author: Rod Gasson
Price: $20.00 Australian (Shareware Registration Fee)
Available From: Local BBS's, Internet FTP Sites, GEnie, other networks

If you're a modem user, then there's a good chance you've heard of QWK mail packet reader programs. At the least, you should have heard of FIDO networks. If you're not familiar with either of these, or if you're not yet using your Commodore to get 'connected', you're missing out on a lot of information about your computer (and a vast array of other subjects) which awaits you on a BBS (Bulletin Board Service) in your area. And QWKRR 128 is one of the best tools available for viewing that information. But before we jump into our review of QWKRR, let's bring those users who haven't a clue as to what we're talking about up to speed with a little history.

Information is everywhere. The explosion in electronic messaging through local BBS systems is a revolution that our Commodore machines have played a large role in creating. And while the vast majority of these systems are operated on MS-DOS computers, the information to be found on them is far from restricted to users of those machines. Thousands of BBS systems are also interlinked via 'networking' protocols, allowing information to be passed quickly from one area to another, and linking users with common interests together from around the world. FIDO is among the most common of these personal BBS networking protocols.

As these systems grew in popularity, it became apparent that BBS systems could allow for more callers if more users would read messages and mail *off-line*. Initially, this involved capturing mail and message areas of interest to you in a capture buffer, storing it away, then reading it after you had logged off. You could then think about your replies, perhaps even create them with a text editor, log back on and post them. This allowed you to spend less time connected to a BBS, gave you more time to think about what you wanted to write; but it was generally far from convenient. Fortunately some bright programmers caught on to this, and mail protocols like QWK were invented, with programs for both the BBS system and user to exchange mail.

Now it is possible to simply request that message areas of interest to you and your mail be collected into a single file for downloading. Compression protocols have also been applied to this scheme to make the packets downloadable in less time. And while these programs were initially created only on MS-DOS machines, the concept and the protocols QWKly spread to other computer platforms. QWKRR 128 is just such a program, and the only one of its kind for the C-128's native operating mode.

If you ever visit the Commodore message bases on Fidonet, you'll find a large following of QWKRR 128 users there. The author himself frequents these areas answering support and general questions about his product. While the documentation is very thorough, it's nice to know that support for a program which hails from half-way around the world is within easy reach. Solutions to problems posed by registered users of the program have always been quickly dispatched, and the author has often provided simple POKE statement patches for users who wished to modify their own copy slightly. This is a level of support that's hard to find on *any* computer platform, and the author is to be highly commended for that.

QWKRR 128 provides the ability to read standard QWK mail packets, has a built-in editor for writing your replies, and can repack the replies into an uploadable QWK reply packet when you're done. It also has the ability to create the reply packet as a standard ZIP archive, which may be required by the system you use for messaging. To unZIP mail packets you have recieved, you'll have to obtain one of the programs designed specifically for this purpose. I personally use UNZIP64 by Bill Lucier, which I downloaded from GEnie. Thus far, the only C-128 program I know of which handles this function is BVUNZIP by Bruce Vrieling, which runs under the CS-DOS shell from Parsec, Inc.

If the system you use to get your mail uses ARC instead of ZIP, you'll need a different file from CS-DOS. The documentation with QWKRR explains these options in fair detail, and users in the Fidonet Commodore conferences will generally be happy to help you if you run into problems getting started. The important thing to note is that either ZIP or ARC files can be dealt with on the C-128, and once you've gotten past that, QWKRR handles the rest. QPX, a utility by Russell Prater is included which helps automate startup.

Drive configuration for QWKRR is more extensive than with most programs, partly because QWK mail packets can be extremely large. The system allows you to assign different locations for the system files, message data, taglines, and replies. A user drive location can also be defined for other operations, such as import and export of text files. Since QWKRR is CMD device compliant, these assignments can be made to different partitions or subdirectories as easily as they can be to different disk drives. I wouldn't recommend this program to any single 1541 drive users, by the way. If you don't have at least two 5.25" drives, or a 1581 drive minimum, you'll probably run into trouble dealing with the combined size of QWKRR and the QWK message packets.

While the number of conferences (message areas) which QWKRR 128 can handle is limited, this limit is well above the number any user I can think of would ever need, up to 1140 conferences. While

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some systems may list every single conference available in their download packets, this function can usually be over-ridden on most systems so that only the conferences you request get listed.

A number of commands are available globally throughout the program. These commands allow you to send DOS commands to your drives, view directories, or move to the Options Menu where you can configure colors and other program options.

Once you move into the main program itself, the versatility is nearly overwhelming. Fortunately, a fair amount of simplicity has been maintained to avoid confusion. Conferences can be dealt with individually, or combined as a whole. You may either jump right into reading your messages and mail, or simply browse the message headers. If you choose to do the latter, you can read selectively by choosing messages whose headers (subjects) interest you. From the main selections you can also opt to directly enter a post for a conference, or you can edit messages or replies you've already created.

I find the ability to browse through the headers to be one of the best additions to this new version of QWKRR. In addition, there is an option called the 'twit list', which lets you define the names of certain individuals whose messages you may be particularly interested in. By doing so, then browsing through the headers, these names can be made to appear in a different color than the rest.

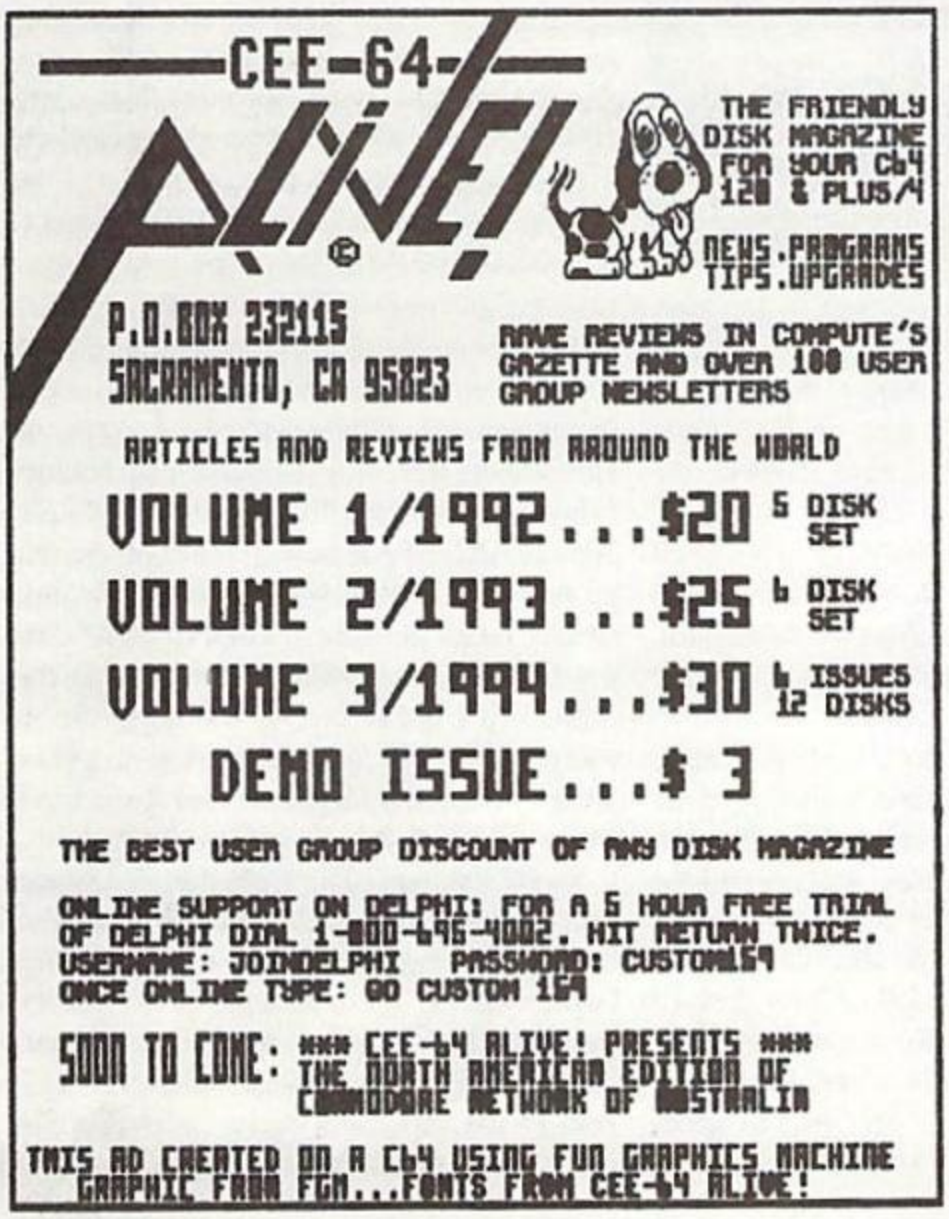
Message retrieval and reading is itself extremely versatile with QWKRR. Retrieval can be forwards or back, or you can jump directly to any message by simply entering the message number. You can view the current message over again easily, or with a single keystroke jump into the editor to form a reply to the current message.

The editor, where your replies or new messages are created, is in my opinion the heart of QWKRR. In older versions, the editor was slow and a bit clumsy. The new editor is quick and responsive, and has an extensive set of shortcuts for moving around. And because the editor is so much improved over previous versions, QWKRR is now a joy to use.

When replying to a message, you can easily excerpt a quote from the original post into your response using the quote mode of the editor. This is the only area where I have a complaint about QWKRR, and it's a small one. Quoted lines often appear short, and I've never cared for how this looks. I'll often re-edit the quoted text by hand to make the lines more to my own liking. I can understand why this was done, though, based on the way the quote mode operates. Most users probably wouldn't even notice this, and it shouldn't be considered a flaw.

The editor also provides for flexibility in adding taglines, which are generally humorous quotations at the end of a message. These are broken away from the main text of the message by a tearline, characters which indicate that the main body of the message has ended. Options abound here, too, with the ability to set different tearline characters, and use different tagline library files.

This covers most of the main functions of the program, but to cover every aspect would require more room than the scope of this review would allow. Suffice it to say that QWKRR does a better job of handling QWK packets than many programs I've used on other computer platforms. It's versatility and speed speak well for both the author, and the capabilities of the C-128. And it bears repeating that if you don't presently have a need for such a program, you'd do well to create that need by getting connected to a Fidonet board that carries the Commodore conferences. **CW**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Graphic Interpretation

by Steve Vander Ark

MORPHING UNDER GEOS WITH MAURICE RANDALL'S GEOMORPH

It's pretty much impossible to keep up with everything, and it's certainly impossible to afford it all.

Things have been changing a lot lately here on my 128 too. It all started with a disk I found in my mailbox a few weeks ago, sent to me by Maurice Randall. Now Maurice, who lives about an hour and a half away from me but whom I've never met, is one of those people who keep my faith in the Commodore computer alive. He has a firm grip on the vision of just what wonders the 64/128 can do and just how much potential there still is in this chunky slab of beige plastic. The disk he sent me contained three GEOS files: a photo scrap, a documentation file, and an application. The application was called "geoMorph."

That's morph, as in morphing, as in those cool effects when the bad Terminator or Odo on *Deep Space Nine* seem to melt from one thing into another. Morphing is state of the art in the realm of computer graphics, the kind of thing that top-flight computer graphics gurus do with state of the art, fancy-dancy, ultra-expensive computers. In other words, it's one of those changes I was talking about in the beginning of this column, the kind of thing I can't afford, thank you.

But hey! This disk promised morphing right here in GEOS on my good old 128. This I had to see for myself. I double clicked on the icon, ready to create a graphics miracle. Of course, I skipped the docs file, since I never read documentation until after I have clearly demonstrated my inability to figure the darn thing out for myself, which usually takes five or six minutes and at least one system crash.

The first thing that came up on my 40-column screen (128-mode is fine, by the way, but the program only runs in 40 columns) was a work space the size and shape of the geoPaint draw window, the usual strip of drop-down menus across the top, and three icons on the left. Then, much to my delight, morphing appeared, right before my eyes. The word "geoMorph" blurred, swirled, and then changed into Maurice's name. The effect was wonderful, like water flowing, from one image into the other. I was pumped.

Well, after clicking on each icon two or three times with little effect and after selecting on the drop down menus anything I couldn't identify, I admitted that I was clueless and opened the documentation file. After a few minutes, I started to get the picture (no pun intended). At the same time I got a good healthy dose of reality. GeoMorph was not really intended to create the kinds of cool morphing I was imagining; rather, it was designed to allow geoPaint users to create a variety of images from one basic drawing. In other words, this marvelous program was intended for computer artists who don't want to draw twenty different trees; with geoMorph they can create just one and morph it into a whole forest of similar but slightly different trees. GeoMorph contained no commands to run the resulting images in any kind of animation.

What a bummer! After all, according to the documentation this program would certainly be able to create a full range of images to convert one picture into another, albeit with a lot of time and mouse clicks. There had to be a way to make these images move on the screen! After all, Maurice himself had used this process to create that nifty title screen. I wasn't going to give up this easily!

The documentation informed me that the images created by geoMorph could be copied or cut from the work area as photo scraps, and I knew there were ways to animate such things. I dug around in my disk drawer and found a copy of Album Animator, a small but powerful program that will "page flip" through a photo album, rather like one of those flip books that my daughter always wants to buy at the Disney Store. All I needed to do was to create my morphing images, sock them away in a photo album in order, then use Album Animator to make the whole thing come to life.

So I fired up geoPaint, created two strange looking faces that looked nothing like each other, then imported them into geoMorph (which was a piece of cake now that I had read the instructions). I discovered I could actually set a variety of controls to affect how the images are modified, and I messed around until I had struck a nice balance between

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geoProgrammist

By Maurice Randall

GET PREPARED TO ENTER THE WORLD OF GEOS PROGRAMMING

Programming in GEOS is an experience that anybody with a little knowledge of machine language can learn. What is nice about it is that GEOS takes care of much of the work for us. And the GEOPROGRAMMER package just carries on with this idea of making our life easier. Nevertheless, it will get you if you are not familiar with some of it's little quirks. Avoid these and you will get hooked on programming like you never thought possible.

I'm not going to try to teach machine language programming itself. That is a subject that can be taken up by another column. I will assume that you already know the basics of ML programming and so we will just get right down to business with GEOS. If you are just learning ML, hang on to these issues and just read this column when you are ready to proceed. Meanwhile, if you haven't already done so, purchase a copy of GEOPROGRAMMER, for this is the only assembler package that I can recommend for anyone wishing to do any serious programming under GEOS.

The advantage to using GEOPROGRAMMER is that it was written to understand the GEOS system. It is a very powerful and easy to use environment. It will naturally create your files in the required GEOS format without any extra work on your part. One of the biggest pluses is that it can assemble a photo scrap right into your code. This is important since GEOS is a graphical environment, and being able to include graphics in your applications can add a nice touch that otherwise would require a great deal of work with any other assembler. At least 95 percent of your work can be done without even having to know specific memory locations also. There is a label or symbol for

almost every important memory location. You will use these labels and symbols throughout your programming, in addition to your own labels and symbols that you create as you write your source code.

One of the most important aspects of GEOS programming is to use your head. Be creative and ingenious. You have the tools and the system to work with. All that is required is for you to think and use common sense. Think of a project to work on. Perhaps there is an Application or Desk Accessory that you would like to see that nobody has ever created. Well, go ahead and work on it. But make it the best you can and put some thought into it. Make it easy to use, and make it useful. Your program should become a part of someone's collection, and it should find itself on that person's most used disks. There are a lot of ideas out there that have not been tried yet.

GeoWrite will be your source code editor and believe it or not, there is no better editor than this for creating your source code. Since GeoWrite displays it's documents a page at a time, you are able to stay better organized by putting each routine on a separate page. It is easier to find a routine this way, which is important when debugging time rolls around. GeoWrite's ability to cut and paste with the mouse is far superior to anything else on our computers. And it's search and replace function is exceptional. You will use that very often. I use it all the time.

Whatever you do, stay organized. And by all means, back up your work. Especially if you are working from a ramdisk that is not battery-backed. Once you have written enough source code to generate a usable program, go ahead and assemble it, link it, and then test it to see what happens. If you have two computer setups, it is handy to do your creating on one and testing on the other. You are sure to have plenty of crashes. Your test unit can be re-booting while you are studying what went wrong on your development unit. As time goes on, I will get into the subject of debugging. You'll more than likely spend more time debugging your work than you will creating the source code.

If you like machine language programming, you will like using GEOASSEMBLER and GEOLINKER. GEOSASSEMBLER is used to assemble your source code files into a code that is relocatable. Your source code won't have any reference to where this code should reside. You can assemble several separate files and then use GEOLINKER to link each of the resulting relocatable files into what is the final result, your application, desk accessory, printer driver, or whatever you can imagine. When you use GEOLINKER, you will establish the

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starting location for your code and it will take care of the rest for you. GEOLINKER will read a special GeoWrite file that you will create. In this file, you will list all of the files you wish to have linked together. They will then be linked in the order as they are listed. The beauty of this is that a routine contained within one file can refer to a routine in another file as though they were one.

Once you have assembled a completed source code file, you needn't reassemble it again unless you make another change to it. The assembled relocatable file will have the same name but with .rel added to it. These .rel files are combined at link time. Some other assemblers do not have a link function and need to reassemble every single source file.

When you get your project to the point where it can be tested, do so before proceeding any further. Put it through any tests that you can. If you discover any bugs at this point, fix them now. It is much easier to add to a bug-free program. It is also easier to remember where you have made your most recent changes that may have caused a bug.

The main thing I must stress with programming in GEOS, is to be elegant. You can be as inexperienced as anybody when it comes to writing ML programs. How much you know is not important. But how you make your program look to the user is very critical. You are not just a programmer here. You are a designer, and an artist. The best programmers in the world are no good if they are not creative. A thoughtful beginner can write better programs with less knowledge and more ingenuity.

Next time around, let's dig right in and do something with our computer. For those who have never written a GEOS program, we will write a very basic application. It won't do anything useful, but will give you a starting point. For those of you who already understand these concepts, I'll share some of my own experiences with GEOS, what to do and what not to do. See you next time. **CW**

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BASIC INSTINCTS

by Gene Barker

Board games remain very popular in the United States. Some are quite complex and require several hours to complete. War games tend to be the most time consuming of the board games, since they often require a lengthy set of steps before each move can be completed. If we were to write a small BASIC program for a game to do some of these steps automatically, the game could be played much faster (which would enhance the overall gameplay).

In this column we will create a BASIC program to do the calculations for our fictional war game BIG GUNS. In the process you will learn some important programming concepts that will help you grow as a Commodore programmer! Let's take a look at the game BIG GUNS.

Firing Process:

1. Select gun you wish to fire
2. Get distance to target
3. Roll one ten-sided die
4. Check Firing Chart for a hit
5. Calculate damage to target using Damage Chart
6. Move on to the next gun - Go to step (1)

Firing Chart:

Distance (yards)	Hit
0 - 499	1 - 9
500 - 1499	1 - 7
1500 - 1999	1 - 5
2000 - 2499	1 - 3
2500 - 3000	1 - 1

Damage Chart:

Gun Size	Damage (points)
1"	5
2"	10
3"	20
5"	50
7"	80
9"	120

In BIG GUNS it is not unusual for a ship to have two guns or more on one turret. On the bigger ships there could be dozens of turrets. Imagine having to go through the above process for every single gun on all of those turrets. NO WAY! All you care about is how much damage you inflicted on the target. Why not have your Commodore do all of the tedious work so you can concentrate on sinking ships?

We'll build BIG GUNS in three steps:

1. Outline main logic
2. Design data structures
3. Create the program

First we need to outline our new program BIG GUNS. We begin by listing only the main logic behind the process we wish to perform. We will figure out the rest later. The outline will help us in our next two steps.

Simple Outline:

```
TOP     Get # of guns to fire (of the same size)
        Get distance to target
        Calculate number of hits
        IF any hits
          Get the size of the guns
          Calculate the damage to target
        END_IF
        IF user wishes to try again GOTO TOP
        ELSE end of program
```

The only real difference between our outline and the Firing Process above is that our outline (new firing process) can handle more than one gun at a time.

Now that we have the general structure to our program, the next step is to consider how we are going to represent the Firing Chart and the Damage Chart in BASIC. Usually the best way to represent such charts is to use an array. For our Firing Chart we need a two-dimensional array. Since there are five distance ranges we will need five sets of numbers in our new array. The first number in each set will be the maximum distance for this range and the second number will be the maximum die roll that will score a hit for this range. We will call this array FC for Firing Chart.

Array	FC(1)	FC(2)
(1)	499	9
(2)	1499	7
(3)	1999	5
(4)	2499	3
(5)	3000	1

NOTE: We do not need the minimum distance for each range since we can figure it out from the previous range AND we do not need the lowest die roll for each range since we know they are all one.

To refer to the die roll necessary for hitting a ship at (2000) yards we would look at FC(4,2) which is a three. This tells us that we must roll a three or lower to score a hit.

Like the Firing Chart we need an array for the Damage Chart. In the Damage Chart there are six different gun sizes; so we will need an array with six sets of numbers. The first number in each set will be the gun size and the second will be its damage. We will call this array DC for Damage Chart.

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Array	DC(1)	DC(2)
(1)	1	5
(2)	2	10
(3)	3	20
(4)	5	50
(5)	7	80
(6)	9	120

If we wanted to know how much damage a three inch shell would inflict, we would look at DC(3,2) which is twenty points of damage.

Now that we have our outline and our data structures designed, we are ready to write our program. Try to understand how each section of the program works before moving onto the next section.

Lines 100-199

- Name the program so that we can figure it out later without the documentation
- Make screen easier to read by poking new colors to the screen

Lines 200-299

- Setup our Firing and Damage Charts using two-dimensional arrays where:
  - SF: Size of Firing Chart
  - FC: 2D Array of the Firing Chart
  - SD: Size of Damage Chart
  - DC: 2D Array of the Damage Chart
- Be careful to align the READ routines with the data order we used in our DATA statements

Lines 300-399

- Get Number of Guns: NG
- Get DIstance to the target: DI
- Make sure distance is not out of range
- Find the Highest Roll for each hit: HR

Lines 400-499

- Calculate the number of hits after all guns have been fired where:
  - NH: Number of Hits
  - RO: result value of current die ROll
- If no hits skip ahead to try again

Lines 500-599

- Get the Gun Size: GS
- Make sure it is a legal gun size
- Calculate the DAmage: DA

Lines 600-699

- Check if user wants to try again

BIG GUNS *program listing*

```
100 REM--------------------------------
105 REM BASIC INSTINCTS W/GENE BARKER
110 REM
115 REM (C) 1994 COMMODORE WORLD
120 REM          MAGAZINE
125 REM--------------------------------
130 REM-
135 REM MAKE SCREEN EASIER TO READ
140 REM-
145 POKE53280,11:POKE53281,0
150 PRINT"{SHFT CLR}{CMDR 7}BIG GUNS!"
200 REM--------------------------------
205 REM INITIALIZE FIRING/DAMAGE CHARTS
210 REM--------------------------------
215 SF=5:DIM FC(SF,2)
220 FOR I=1 TO SF
225 : READ FC(I,1),FC(I,2)
230 NEXT I
235 SD=6:DIM DC(SD,2)
240 FOR I=1 TO SD
245 : READ DC(I,1),DC(I,2)
250 NEXT I
255 REM-
260 REM CHART DATA
265 REM-
270 DATA 499,9,1499,7,1999,5,2499,3
275 DATA 3000,1
280 DATA 1,5,2,10,3,20,5,50,7,80,9,120
300 REM--------------------------------
305 REM GET # OF GUNS AND DISTANCE
310 REM--------------------------------
315 PRINT
320 INPUT"# OF GUNS TO BE FIRED":NG
325 INPUT"DISTANCE TO TARGET":DI
330 REM-
335 REM CHECK DISTANCE
340 REM-
345 IF DI>=0 AND DI<=3000 THEN 360
350 : PRINT"DISTANCE OUT OF RANGE"
355 : GOTO 325
360 REM-
365 REM GET HIGHEST ROLL
370 REM-
375 FOR I=1 TO SF
380 : IF DI<=FC(I,1) THEN 390
385 NEXT I
390 HR=FC(I,2)
400 REM--------------------------------
405 REM CALCULATE # OF HITS
410 REM--------------------------------
415 NH=0
420 FOR I=1 TO NG
425 : RO=INT(10*RND(0))+1
430 : IF RO<=HR THEN NH=NH+1
435 NEXT I
440 REM-
445 REM CHECK FOR ANY HITS
450 REM-
455 IF NH<>0 THEN 470
460 : PRINT"NO HITS"
465 : GOTO 600
470 PRINT"# OF HITS"NH
500 REM--------------------------------
505 REM CALCULATE DAMAGE
510 REM--------------------------------
515 REM-
520 REM GET/CHECK THE GUN SIZE
525 REM-
530 INPUT"ENTER THE GUN SIZE";GS
535 FOR I=1 TO SD
540 : IF GS=DC(I,1) THEN 560
545 NEXT I
550 PRINT"ILLEGAL GUN SIZE"
555 GOTO 530
560 REM-
565 REM NOW ADD UP DAMAGE
570 REM-
575 DA=DC(I,2)*NH
580 PRINT"DAMAGE"DA
600 REM--------------------------------
605 REM CHECK FOR A TRY AGAIN
610 REM--------------------------------
615 PRINT
620 PRINT"TRY AGAIN (Y/N)?"
625 GET X$
630 IF X$="Y" THEN 300
635 IF X$<>"N" THEN 625
640 END
```


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ADVANCED TECHNIQUES

by Doug Cotton

One of the great assets that Commodore programmers often overlook is the ability to create programs that work on both the 64 and 128 in their own native operating mode. Keeping in mind that you should always avoid doing anything that can cause unforeseen compatibility problems, this becomes a fairly simple task. After all, Commodore has seen fit to create common jump tables for their 8-bit machines, as well as keeping BASIC 7.0 backwards-compatible with BASIC 2.0. These combine to make creating programs that work on both machines relatively easy. Please note that some of the BASIC commands used in this article will require entry on a 128 in 128 mode.

One of the first steps towards making a program work on both the 64 and 128 is determining which computer the program is running on. One simple peek can accomplish this:

```
F=PEEK(65533)
```

This will return a 252 on a 64 and on a 128 in 64 mode, or a 255 on a 128 in 128 mode; thus the variable F will be set accordingly. To make the variable F easier to work with, we can modify this check slightly using the ABS function. So let's do it this way:

```
F=ABS(PEEK(65533)=255)
```

The ABS function allows us to make F equal to either 0 or 1, based on whether the statements enclosed in parenthesis after the ABS are true or not. Thus, if location 65533 holds a value of 255 (as it will on a 128), F becomes 1. If some other value is found, F becomes 0. With F holding either a 1 or a 0, we can easily test and use it to determine program flow with IF and ON functions.

So now that we can determine if we have a 64 or a 128, what do we do with this knowledge? Well, if code is to remain truly common, we're going to have to determine how big the screen is, and adapt for it. Naturally the screen is 40 columns wide if we're running on a 64 (or a 128 in 64 mode). But a 128 in 128 mode could have a screen width of either 40 or 80 columns. A quick check of the 128's zero page variables shows that location 215 can tell us what screen mode we're in. The 128 actually uses the high bit in this byte as a flag for 40/80 columns, so a correct test of this location should assume that any value above 127 means that the machine is in 80 columns, and any value from 0 through 127 means 40 columns. That's easy enough to code, and there are several ways to do it. One way would be:

```
M=ABS(PEEK(215)>127)
```

Now the variable M will be set to 0 for 40 columns, and 1 for 80 columns. But wait! We'll have to make sure that we're dealing with a 128 in 128 mode before making this check. Thus:

```
IFFTHENM=ABS(PEEK(215)>127)
```

Okay, now we know the screen width, so we can make some adjustments. Assuming at this point that we have a 128 in 128 mode using an 80 column screen, we're going to want to adjust things so that our output will look similar to what we would see on a 40 column screen; unless we want to write completely separate routines for screen layout, in which case we may as well write separate programs altogether. Since this article is about making universal programs, we'll assume that a simulated 40 column screen will do.

There are two ways we could go about this. We can center a 40 column window on an 80 column screen, or we could muck about with the VDC to make the screen appear just as it would in 40 columns. There's actually a third choice, which is to tell the user to switch to 40 column mode, but if we avoid that we can take advantage of the 128's 2 MHz mode. Since playing around with the VDC to simulate 40 columns could probably take an article all by itself, let's settle for centering a 40 column window on the 80 column screen for now. And while we're at it, let's get the processor running in 2 MHz mode:

```
IFMTHENFAST:WINDOW2Ø,Ø,59,24,1
```

Okay, all bases are now covered to allow us to write a program that works on the 64 or 128, giving similar screen output. To start our program, we can combine all of this into the starting line of the program, thus:

```
1Ø PRINTCHR$(127):F=ABS(PEEK(65533)=255):M=
Ø:IFFTHENM=ABS(PEEK(215)>127):IFMTHENFAST:WI
NDOW2Ø,Ø,59,24
```

Since this is the beginning of a program, I threw the PRINTCHR$(127) at the front to clear the screen. I also added an M=0 before moving into 128-specific code, so that M would be defined and cleared in case the program were run on a 64 (or a 128 in 64 mode). The clear option (,1) at the end of the WINDOW statement is optional, and not really necessary since the entire screen has just been cleared at the start of the line, so I left that out.

Now that the preliminary setup is out of the way, we can should discuss other techniques involved in keeping code workable in both 64 and 128 modes. Here are some suggestions to ponder when writing common code:

1. Use BASIC 2.0 commands only, except when a BASIC 7.0 command is required to make a 128 perform a task that must be done differently on a 128. In such cases, be sure to use an 'IFFTHEN' before the BASIC 7.0 command.

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2. Verify memory location usage before using any PEEK or POKE commands. While many system variables use the same locations on both the 64 and 128, many others do not.

3. Use the BASIC 7.0 BANK statement when using PEEK, POKE and SYS commands to assure that the correct bank of memory is configured. Don't forget to precede the BANK statement with an 'IFFTHEN'.

4. Look before you leap. SYS locations will be different for user-written machine language routines on 64's and 128's. If you plan to use some custom ML, create an offset variable which can be added to any SYS command. While there are different ways of getting your ML in place, making a single program file with all code resident is simpler for users to deal with. Make your ML relocatable, and tack it on to the end of your BASIC code. If your program is mostly ML, then make the first portion a relocatable routine that can move the remaining code to common location in either a 64 or 128.

I'll let you think about these suggestions until next issue, where I'll show you how to implement them all - with special attention being paid to item 4, since many advanced programmers will want to mix ML and BASIC for quick development of efficient programs. CW

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Peripheral Vision

By Mark Fellows

AN OVERVIEW OF THE DOS THAT POWERS CMD DEVICES

CMD DOS (Disk Operating System) is the control program built into CMD's HD, FD, and RAMLink which is responsible for controlling all operations related to these devices. The DOS interprets commands from the computer and responds by performing the requested operation (load, save, format, etc.). The DOS breathes life into CMD devices; without it, our equipment would do little more than take up space on your computer desk. Of course, this is also true for Commodore disk drives (such as the 1541, 1571 and 1581) which, like CMD HD and FD drives, are "intelligent" and contain an on-board microcomputer which by nature requires a control program (DOS) to function. RAMLink, instead of having its own microprocessor, uses the C-64 or C-128 microprocessor to perform its functions and in that respect can also be regarded as an intelligent device.

The FD and RAMLink (like Commodore disk drives) have their DOS programmed onto a ROM (Read-Only-Memory) chip. The HD has its DOS stored in a hidden area (partition) on the hard drive and is downloaded to RAM each time the drive is powered-up.

Compatibility

The core of CMD DOS provides an emulation of Commodore DOS 1541, 1571 and 1581 commands. This enables CMD devices to act and respond like Commodore disk drives, which provides the user with a familiar command structure along with a high degree of software compatibility. In other words, you can plug in a CMD device

and use it just like your other Commodore disk drives. Even RAMLink, which plugs directly into the computer's Cartridge Port, appears as a disk drive, even though programs and files are being accessed from a solid-state RAM disk.

All CMD devices support PRG, SEQ, REL and USR files along with all file-related commands, including Load, Save, Verify, Open, Close, Scratch, Rename, Copy, and Record Position. Direct Access files are supported along with the Block-Allocate, Block-Free, Block-Read, Block-Write, Buffer-Pointer and Block-Execute commands. The 'User' commands are also provided: UØ, U1 (block read), U2 (block write), U3-U8 (jump), UI (warm reset) and UJ (cold reset). Memory access commands are also included (Memory-Read, Memory-Write, and Memory-Execute), along with support for Utility Loader and Autoboot Loader files. 1541, 1571 and 1581 Job Queue locations and commands are emulated on all CMD devices, and a special extended 'Native' Job Queue is also provided. Fast serial 'Burst' commands are supported on the HD and FD.

Commands are sent to CMD devices in the usual manner (over the Command Channel; Secondary Address 15). The Error Channel is also accessed in the same manner as with other Commodore disk drives. Files are opened and closed and file data is accessed through the normal BASIC commands or Kernal routines. The directory structure of CMD devices is the same as Commodore disk drives and directories can be viewed by using the standard commands. Commodore wild card and pattern matching syntax is supported as well.

The close adherence to Commodore DOS standards makes CMD devices compatible with nearly all C-64/128 software and eliminates the need for program modifications. In addition, GEOS compatibility is provided through special Configure files supplied with the devices or through CMD's gateWay desktop.

Partitions

Because of the large capacity of CMD devices, CMD DOS provides a means of organizing the storage area into manageable sections. On the FD and RAMLink you can divide the overall storage space into as many as 31 segments (partitions), while on the HD, as many as 254 partitions can be created. Partitioning a CMD device is similar to dividing a large disk into a number of smaller disks and is accomplished through the use

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of a menu-driven utility program included with each device. Each partition is referred to by number, has its own directory, and is treated as if it were a separate disk. This makes partitions ideal for keeping different programs and their related data files separate from one another. The currently selected partition can be changed by using the CMD DOS 'CP' (Change Partition) command. When a partition is currently selected, the files within the partition can be accessed by specifying Drive Ø (or no drive); for example:

```
LOAD"Ø:PROGRAM"
LOAD":PROGRAM"
LOAD"PROGRAM"
```

Files can also be accessed in any partition at any time by including the partition number in the filename, as in this example:

```
LOAD"12:PROGRAM"
```

CMD Emulation Mode Partitions

These partitions emulate the track and sector and directory/BAM layout of 1541, 1571 and 1581 disks exactly. The main reason for the existence of Emulation Mode partition is software compatibility (some programs expect the directory and BAM to be at specific track and sector locations). A good example is the standard GEOS desktop, which will work on the HD and FD only through the use of 1581 Emulation Mode partitions.

CMD Native Mode Partitions

CMD Native Mode partitions are the most flexible and powerful type of partition. Native Mode partitions can be as small as 256 blocks (64K) or as large as 16 Megabytes and are defined in 256 block increments. Native Mode partitions are ideal because you can tailor the size of the partition to the exact needs of a program and its files without wasting space or running out of room. Most programs can run from within Native Mode partitions; a notable example is CMD's gateWay desktop for GEOS. Native Mode partitions can also contain CMD's MS-DOS style subdirectories.

CMD Direct Access Partitions

This type of partition is available on RAMLink and is used primarily with GEOS and gateWay. A Direct Access partition allows you to set aside a specified portion of RAM for use by programs that require an REU-style RAM buffer area. A Direct Access partition is not accessible to the user outside of the programs that use the Direct Access RAM buffer, in order to avoid corruption of data stored there by the program.

Native Mode Subdirectories

CMD DOS Native Mode subdirectories are similar in structure to the subdirectories used on MS-DOS computers. When a subdirectory is created on a CMD Device, a DIR type file (filetype 6) is created and added to the current directory. Subdirectories share all of the available space within a partition. In other words, if there are 12000 blocks free in a partition, all subdirectories within that partition will show 12000 available free blocks. If a 37 block file is saved in any subdirectory within the partition, all subdirectories within that partition will indicate 37 fewer blocks.

Subdirectories may be created in the 'root' directory (the first or main directory in that partition) or within another subdirectory. Placing a subdirectory within another subdirectory is called 'nesting'. There is no actual limit to the number of subdirectories located in a partition, nor is there any limit to how deep subdirectories may be nested.

CMD DOS includes a series of commands to facilitate the use of Native Mode subdirectories, and are similar to their MS-DOS counterparts. 'MD' (Make Directory) creates a new subdirectory; 'CD' (Change Directory) changes the currently selected subdirectory; and 'RD' (Remove Directory) deletes a subdirectory. In addition, Native Mode subdirectories introduce the concept of 'paths' to the Commodore user. CMD DOS paths are similar to MS-DOS paths, with the subdirectory names set between slashes (/) in the filename. For example, to load a file in a subdirectory nested two deep, the following command could be used:

```
LOAD"//SUB 1/SUB 2/:PROGRAM"
```

Additional Features

Because the designers at CMD are also users of the Commodore 64 and 128, a lot of extra features have been packed into each of the CMD hardware devices. These features lend to the devices' performance, ease of use, or are often just plain handy for getting the most from your hardware. The following paragraphs describe a few of these.

Built-in JiffyDOS

JiffyDOS is CMD's disk drive speed enhancement system. Normally, it is installed as a ROM chip upgrade in your C-64/128 and each disk drive that you wish to speed up. Purchasing a RAMLink, HD or FD, however, automatically gives you one-half of a JiffyDOS system. With RAMLink, the JiffyDOS computer (Kernal) ROM is built into CMD DOS, giving you the full benefit of JiffyDOS without having to disassemble your computer to install the JiffyDOS ROM. The HD and FD have the JiffyDOS drive code built into their version of CMD DOS, which means that they perform up to 15 times faster than Commodore drives when attached to a JiffyDOS-equipped computer. The HD and FD are also compatible with non-JiffyDOS computers.

Real-Time Clock Support

CMD DOS includes support for the standard or optional Real-Time Clock (RTC) modules available on the HD, FD and RAMLink. If an RTC module is present in a CMD device, CMD DOS will automatically time and date stamp all files when they are created or modified. The time and date is written to the file's directory entry in a GEOS-compatible format. CMD DOS also allows you to view directory listings that include the time and date stamp, and provides parameters for selective directory listings according to whether the file was created or modified within a specific timeframe. This feature makes it easy to backup only those files which have been modified since the last backup was made.

GEOS Support

All CMD devices fully support GEOS. The HD and RAMLink include special versions of CONFIGURE designed to work along with CMD DOS to provide full GEOS functionality and optimum performance, while the FD is automatically recognized as a 1581 by GEOS. 1581 Partitions are supported under the standard GEOS desktop on all CMD devices. On RAMLink, 1541 and 1571 REU-style RAMdisks are also supported along with full REU emulation. Under gateWay, CMD's replacement desktop for GEOS, Native

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Mode partitions and MS-DOS style subdirectories are also supported on all CMD devices along with variable-size RAMdisks of up to 2 Megabytes on RAMLink.

SWAP Feature

The SWAP feature, found on all CMD devices, has proven to be a highly valuable and convenient function of CMD DOS. Each CMD device has a front panel SWAP switch that allows you to instantly change its device number to 8 or 9, and at the same time, swap the CMD's device number with that of any existing device numbered 8 or 9. SWAP is most useful when a program can only be loaded from device 8 or 9. If your CMD device is normally set to another device number (12 for example), you can still easily load these programs by using the SWAP function. The SWAP function can also be useful even if a copy-protected program cannot be loaded from a CMD device. In such a case, you would first load the offending program from your 1541 or 1571 (device 8) and then SWAP the CMD device to device 8 after the program loads. This allows you to store the data files written by the program on your CMD device. SWAP can also be used even if you do not already have a device 8 or 9 on the serial bus. In addition, CMD DOS also includes a series of software SWAP commands which can be sent from within programs to perform the device number swapping.

Special Commands

As mentioned previously, CMD DOS emulates all Commodore DOS commands and also includes a set of enhanced commands that provide a means of accessing the extensive storage capacity and advanced hardware features of CMD devices. See the sidebar for a brief overview of these commands.

CMD Device Special Commands

CP*n*	Select partition *n* as current partition
MD:*dirname*	Create Native Mode subdirectory
CD:*dirname*	Change current Native Mode subdirectory
RD:*dirname*	Remove (delete) Native Mode subdirectory
$=T	Directory that includes time and date stamp
$=P	Directory of all partitions on the CMD device
L:*filename*	Lock/Unlock a file
R-P:*newname=oldname*	Rename partition
R-H:*headername*	Rename directory header
W-1	Write protect a disk (HD and FD only)
W-0	Undo a previous W-1 command
S-8	SWAP to device number 8
S-9	SWAP to device number 9
S-D	SWAP to default device number
G-D	Get diskchange status (FD only)
G-P+CHR$(*partition*)	Get partition information (type, size, etc.)
T-RA	Read RTC time and date in ASCII format
T-WA+"*date/time*"	Write RTC time and date in ASCII format
T-RD	Read RTC time and date in decimal format
T-WD+CHR$(*date/time*)	Write RTC time and date in decimal format
T-RB	Read RTC time and date in BCD format
T-WB+CHR$(*date/time*)	Write RTC time and date in BCD format
S-C+CHR$(*SCSI command*)	Send SCSI command (HD only)

Device Numbers

RAMLink and the HD can be set to any device number from 8-30 by running a utility program provided with these devices. CMD DOS saves this device number setting in the system partition, and remembers it each time the computer or drive is powered-up or reset. The FD can be set to any device number from 8-15 by means of a rear-panel DIP switch.

RAMLink Autofile

A noteworthy feature of CMD DOS in RAMLink is its ability to automatically load and run a BASIC or machine-language program from any device whenever the computer is powered up or reset. This feature, called the 'Autofile', can be used on a C-64 as well as a C-128 in both 64 and 128 modes. A utility program supplied with RAMLink allows you to easily enable or disable the Autofile function as well as define the program parameters (device number, program name, type, SYS address, etc.).

RAMLink Parallel Port

RAMLink includes an 8-bit parallel port which can be connected to the parallel port on CMD HD hard drives. Using the parallel port can provide a 4x increase in data transfer speed between the computer and HD (loading, saving, etc.). CMD DOS in RAMLink senses whether the HD is connected via the parallel cable and will automatically divert serial data transfers to the parallel cable. A software command is also provided with RAMLink that allows the parallel port to be enabled or disabled. **CW**

Q: What do all of these drives have in common?
A: They all perform at their best with The Compression Kit.

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CARRIER DETECT

Desterm Changes Hands

Desterm, the popular Shareware telecommunications program for the Commodore 128, has recently been taken over by Steve Cuthbert. Steve has released version 2.01, which has been in beta testing for quite some time. The new version is generally being used by those in need of RAMLink compatibility (something which did not exist in version 2.0). The new owner reports that he will be working on further improvements to the program. Shareware fees for all Desterm versions should now be sent to:

Steve Cuthbert
Box 196
Radway, Alberta Canada T0A-2V0

The author may also be contacted for suggestions or support through the following on-line addresses:

INTERNET: steve_cuthbert@cuehere.graysage.edmonton.ab.ca
FIDO: Steve Cuthbert (1:342/24)

You may FREQ the new version from 1:342/24 using the name DESTERM, or download it directly from the Desterm Support Bulletin Board at 1-403-497-7816. Other BBS's supporting Commodore users may also have the new version available.

Zmodem Has Arrived

Commodore users have long desired the ease of downloading with ZMODEM, a file transfer protocol popular on many other computer platforms. Brian Bell, author of OMNI 128 BBS has recently added ZMODEM download capabilities to the list of protocols supported by his program. Bell indicates that the current version employed by his system is not the complete protocol, but does offer most of the features. Users who wish to use ZMODEM for downloading will have to check into Novaterm for the C-64. Desterm for the 128 may also include the protocol in future upgrades. Brian Bell may be contacted through his Bulletin Board, OMNI World, at (206) 536-9717.

Novaterm 9.5 Released

Nick Rossi, author of the shareware terminal program Novaterm, has recently released version 9.5. The new version includes bug fixes from the previous version, adds a ZMODEM download protocol, plus CTS/RTS support to improve performance with high-speed modems. Updates are available on GEnie and other services, or directly from the author.

Quick Changes

QWKRR 128, a Commodore 128 off-line QWK mail packet reader by Rod Gasson, has been updated to version 4.2. Many improvements have been made to the reply editor and other program operations, and a number of new features have been added. QWKRR is a shareware program, and can be found on many networks and local BBS systems.

On-line Services Look To Cable

Several on-line service providers, including CompuServe, Prodigy, and America Online, are looking into the prospect of tapping the resources of existing cable television networks. Both CompuServe and Prodigy have already begun test marketing using the HomeWorks modem produced by Zenith. The HomeWorks modem connects directly to your television cable system, and provides a throughput of 500 K baud, far exceeding the speeds of current standard telephonic modems. Cost of these modems is presently very high, at around $500, but should drop substantially once such services becomes widespread. America Online is slated to begin test marketing their service later this year using a competing cable modem produced by Intel and General Instruments.

New Serial Interface Specification

Texas Instruments and Apple have been jointly working on a new serial port specification dubbed the P1394 by TI. Apple, with its usual panache, has given the port an alternate name of 'FireWire'. The new port boasts a raw transfer rate of up to 12.5 MB per second, and allows multiple devices to be attached and used through a single port. TI sees it as a universal I/O port, and hopes to see it implemented in a manner that will eliminate IDE, SCSI, parallel and serial ports on future computing devices. The specification is up for ratification by the IEEE standards committee, and has backing from several major vendors.

America Online Fiddles While Q-Link Burns

America Online, Inc., operator of online services America Online and Quantum Link, recently announced restrictions in services to it's America Online subscribers. Citing unprecedented growth as the cause for recent slowdowns in system response time, the company has begun to limit the number of users which can be online during prime usage hours. This move is intended as a short-term solution, and will remain in effect until additional equipment can be installed.

AOL's Quantum Link service for Commodore 64 users, continues to see declines in both services provided, as well as in membership. Users apparently have been making a mass exodus recently, claiming displeasure at AOL's handling of system problems that have kept new uploads from being added to the software libraries for well over a year. The system bug responsible for this action is apparently making files already in the libraries inaccessible, with reports coming from the system to indicate that requested files can no longer be located for download. In recent weeks, AOL has removed the GEOS Arena and shut down Club Caribe. Additional problems are now reported with the conference rooms located throughout the areas no longer working properly, causing any user who enters one to be stuck with a locked-up system. Subscribers are claiming that complaints to AOL are being met mostly by silence, though responses earlier in the year from company representatives indicated that they [AOL] were aware of the problems, but that solutions would be more expensive to implement than deemed possible by the remaining number of subscribers.

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BBS SPOTLIGHT

COLOR 64 BBS

BBS Spotlight will bring Commodore World readers information about BBS programs and networks in each issue. In this, our first installment, we'll take a look at Color 64 BBS software and networking. Fred Ogle, co-owner of Color 64, has provided us with the information contained in this issue's article.

Could you give us a brief history of the COLOR 64 BBS software?
Color 64 BBS was written by Greg Pfountz in 1984, and modified over the years. Originally the program consisted of two basic overlays - one ran all day long, and the other that handled the midnight maintenance routines. Over the years Color 64 has evolved into a system that uses six basic overlays or more, depending on the features you wish to offer.

What version number is COLOR 64 up to now?
Effective 04/15/1994 we are shipping Color 64 V8.0.

Is it expensive?
The price for Color 64 BBS V8.0 is $65.00, plus $3.00 for first-class delivery.

What exactly do you get for that price?
The package you get with Color 64 V8 is a four-disk set, which includes all the files needed to run the BBS, including Color 64 Network, as well as a stand-alone editor, etc. There are also some games supplied, like Stock Market, Empire II Deluxe, Grungy Towers, BWF Wrestling, and some others as well! Game are stored in self-extracting (sfx) archives with complete installation docs, so the fourdisk set is chock full of goodies!

Are there any extra goodies someone would want to get as well?
Color 64 BBS offers THOUSANDS of support files on our support BBS, and at no cost to the sysop other than the price of the call. There is also a wide network of support for Color 64 BBS on the support BBS, Color 64 Network, and on GEnie. I also offer direct support for Color 64 BBS every Monday night in GEnie's Commodore Flagship (Page 625;2, Room #9) from 10 PM - 1 AM EST. This is very reasonable at GEnie's standard connect rate ($3 per hour).

What kind of modems and baud rates are supported?
Color 64 supports all Hayes compatible modems, including modems in excess of 2400 bps, using CMD's "Swiftlink" UART cartridge. For standard RS-232 interfaces, 300-2400 bps is supported. When using Swiftlink, 300-38400 bps is supported.

For those people who have a Turbo-Master 4.09 MHz CPU for their C-64, it is supported as well, both with and without Swiftlink.

What kind of drive support does it have? And what would constitute a minimum system?
Color 64 BBS supports all drives. Xetec Lt. Kernal, InConTrol DataChief and MiniChief, CBM models, RamLink, and of course the CMD-HD & FD drives.

You could run a bare-bones system on 2 1541 floppy drives - Of course, a means of loading an overlay fast is needed, such as a ram expander, fastload cartridge, or optimumly, JiffyDOS.

Does COLOR 64 support any special drive features, such as 1581 partitioning?
Color 64 supports 1581, CMD-1581, and CMD-NATIVE mode partitions, and will read the time right off of your CMD-HD/FD/RamLink. Files and messages are date/time stamped as well.

Which kind of terminal emulations can callers use to access a COLOR 64 board?
Color 64 V8 supports C/G, ASCII, and ANSI graphics in 15 colors.

What can you tell us about the message bases?
Currently there is a maximum of 18 message bases and 232 total public messages allowed, but there is complete message threading. I suspect there will be an overhaul of the messaging system in the future - there are many goodies to be added. Public posts/replies are stored as single sequential files.

How about the upload and download areas?
Color 64 BBS allows from 1-99 U/D areas. File descriptions are kept as separate files, and keep track of the uploader and the time the file was uploaded. Up to 999 files per U/D area is permitted.

Punter, Multi-Punter, Xmodem-CRC, and Xmodem-Checksum are available. We are currently working on Xmodem 1k & Ymodem batch as well.

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You mentioned a network module. How does that work?

Color 64 Network is both easy to run and use. There is even a billing system for sysops who wish to charge - a charge for the first 1,000 bytes, and a charge for each 100 bytes thereafter. Disabling the billing feature is as easy as ignoring it.

There are also other features that are easily added, like "Echo-Net", which will allow messages in the public message bases to be echoed back to the node from which they came. This often leads to lively banter between diverse users on differing systems.

There is also a feature in Color 64 V8 Network that allows the sysop to send or receive *any* prg or seq file. We have tested this feature many times with files in excess of 1,000 blocks.

Does the program come with complete documentation?

The documentation for Color 64 V8 is in an 8.5 X 11 binder, and totals over 150 pages. Everything from setting the BBS up to a complete list of variables, commands, subroutines, etc. is covered. I'd like to think we left no stone unturned :)

Provided the documentation doesn't enlighten someone enough, how would one go about getting more direct support?

I can be e-mailed on the Internet, GEnie, or via Color 64 Network. I provide a 24 hour support BBS, and file support can be had there, or on GEnie. I can also be reached via my Post Office box.

A lot of BBS operators like to modify their BBS software to do special things, or make it look different than other systems. Is this something they can do with Color 64?

Color 64 BBS V8 is a hybrid of ML and BASIC. The extensive use of these ML commands from basic assures that the BBS runs very fast, even though the system runs in basic - uncompiled basic. That means you won't have to compile programs after modifying them! **CW**

Color 64 BBS is available from:

Fred Ogle
P.O. Box 35427
Dundalk, MD 21222-7427

Partial Listing of Color64 BBS Systems

System Name	Sysop	Location	BBS Number
Sonic Temple (Color BBS HQ)	Fred Ogle	Dundalk MD USA	(410)285-0428
Sports Zone	Mike Sapeta	Baltimore MD USA	(410)285-4312
Train Works	Brett Sedore	Barrie OT Canada	(705)734-2916
Heartland Connection	Ron Stoll	Americus KS USA	(316)343-9235
Loveboat	James Frazier	St. Louis MO USA	(314)481-5846
Silicon Empire	Robert Sargeant	Washington DC USA	(301)564-9332
AMME Jr	Michael Bryant	Lacy WA USA	(206)491-4125
Thee Flea's Pit	Tom Hughes	Seattle WA USA	(206)763-4218
Starboard 64	Brian Sherven	Reno NV USA	(702)322-6009
W. Texas Tumbleweed	Robert Covington	Lubbock TX USA	(806)748-1009
Wings	Darin Pfaff	McClellan AFB CA USA	(916)987-1076
Sunlight BBS	Bill Creveling	Sun Valley NV USA	(702)673-2927
Copen's Castle I	Darren Liberton	Tyler TX USA	(903)534-1971
Chatter Box BBS	James Ellis	Indianapolis IN USA	(317)899-1942
The Library	Brenda Myhre	Tacoma WA USA	(206)565-0690
Mecano BBS	Francois Jolicoeur	St. Leornard PQ Canada	(514)955-5372
Realms of Horror	Jim Mazurek	Chicago IL USA	(312)286-6123
The Outhouse	Brian Lauzon	Winnipeg PM Canada	(204)261-3614
Seek & Destroy	Tim Monroe	Bristol VA USA	(703)669-1244
Black Cat BBS	Earl Rutledge	Tampa FL USA	(813)985-6214
Subterranean Network	Paul Bergeron	Bristol CT USA	(203)589-3273
Beaky BBS	Wayne & Dave Singley	Cohoes NY USA	(518)783-1631
North Pole	Bob Tortorelli	Darien IL USA	(708)986-1295
Deja Vu BBS	Tony Bossaller	St. Louis MO USA	(314)894-9271
Prototype BBS	Eric Villeneuve	Longueuil PQ Canada	(514)651-9746
Outback 128 BBS	Jim Jacobs	Forest Park IL USA	(708)366-0882
Elves Den	Jim Ostrander	Little Falls MN USA	(612)632-6339
Uncle Bob's Cabin	Bob Schaffer	Allentown PA USA	(610)433-7880
Aladdin's Lamp	Ernest Tipton	Kempner TX USA	(817)547-6865
The Graveyard	Scott Ogle	Austin TX USA	(512)445-0301
Better Mouse Trap	Ray Balasa	Lynnwood WA USA	(206)775-8067
Twilight Zone II	Tim Allen	Mesa AZ USA	(602)827-2706
Viper's Pit	Michael LeComte	Aurora CO USA	(303)343-9964
Desert Oasis	Richard Cunningham	Phoenix AZ USA	(602)246-7195
IT BBS	Anthony Sitko	London OT Canada	(519)657-2287
Twilight Zone	Jeanne Mabry	Pasadena CA USA	(818)351-9474

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Over The Edge

By Charles A. Christianson

RAINING ON THE PENTIUM PARADE

Pentium. You've heard the term. If not, you've perhaps been hiding out in some third-world country. Pentium. The Intel processor that was going to change the computing world as we know it. It's been in all the industry magazines, user magazines, newspapers, national news, even in network TV ads. Pentium. Now we have it. So what do we do with it?

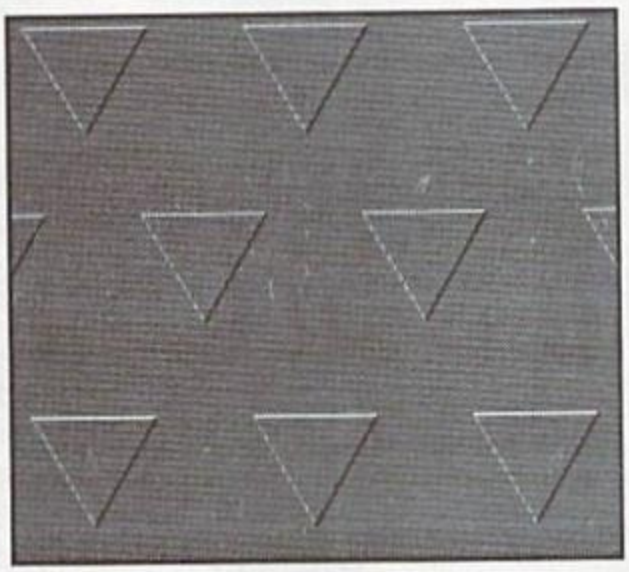
We need Pentium for faster network servers. Ask anyone who knows anything. Nevermind the fact that Compaq and Novell had 1,000 PC's running under NetWare 4.0 on a single 66 MHz 486DX2 server at the 1993 Interop trade show, and with all these workstations combined they only managed to use 42 percent of the server processing capacity? Hmmm, maybe we don't really need Pentium servers.

Workstations! We obviously need Pentium workstations. Why? It will make us more productive. It's fast.

Okay, let's consider this. Most workstations are used for database applications, and receive their data from a server. Ever run such a workstation? Ever notice when it's slow? It's slow when it is storing data to or receiving data from the server. Hmmm... if our servers are not overtaxed, and our workstations are only slow when accessing the server, what is the problem?

I/O. Input/Output. The physical network connections themselves. This is where the industry lags. We don't need Pentium. Or Alpha. Or PowerPC. We need better and faster I/O.

This is something Commodore 8-bit owners can identify with. Equate this with using a Commodore 64 and 1541. Slow, because the Commodore serial bus is slow. Just like current network protocols. But the 128 has FAST



SERIAL. So we hook up a 128 to that 1541. Still slow. Ah, the 1541 is slow serial, so we need a FAST SERIAL drive. Hook up a 1571. Much better.

But is there still room for improvement? Of course. Try a 1581, CMD FD or CMD HD. Add JiffyDOS to the computer. Nice. Fast. But is there still room for improvement? Sure. We need parallel hookup, not serial. Okay, we add a RAMLink to interface to the CMD HD. Ah! Better. But the HD isn't instantaneous. How about some RAM? Ah, now we're there. Parallel I/O with nearly instantaneous access to peripheral storage.

What's the point? The point, my friends, is that the business world once again needs to take a lesson from its forgotten roots: the 8-bit community. They need parallel access networking and I/O that operates at processor speed. Until that happens, no Pentium, double-clock Pentium, triple-clock 486DX4 or any other high-speed processor is going to affect the data bottleneck that exists.

So wha's the big deal about Pentium? Well, it's a marketers dream. It's another means by which Intel and other large manufacturers have managed to get MS-DOS users to part with more of their hard earned money. As long as we are on the subject of PC's, let's take a look at the advantages and disadvantages of trading in your trusty Commodore for a new PC.

Let's begin with the argument so frequently used by PC owners and those of us who try to justify the investment. PC's are cheap! Right? You can buy a 486 for around $1,000 right? Right! Now, there must be a reason why some 486's cost as little as $1,000 and some cost upwards of $3,000. Usually the cheaper systems are made from cheap and poorly matched components and are pretty well stripped down. For example: You might find a 486SX with a 33 MHz processor which has a 32-bit bus just like the $2,000 machine. But here's where they get you; instead of using 32-bit VESA Local Bus cards to match the processor bus, they use 8-bit cards. Now what do you think happens? You get 32 bits of screaming fast data flying out of the processor that slows down to the dead crawl of an early 80's PC when it hits the 8-bit bus on the I/O, video, or drive controller cards. The result: a dog of a machine! So I guess you get what you pay for!

OK, you've decided to go with a middle of the road 486 for about $1,600. Now, let's add a few software titles to make this sleeping giant actually do something. The following list was compiled from ads in the April '94 issue of Computer Shopper and will give you an idea of costs associated with building a complete system using reasonably priced equipment.

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486DX33 (8MB/245 HD/Windows/DOS)	$1,600.00
24 Pin Printer	$200.00
Microsoft Word (Word Processor)	$289.00
Microsoft Excel (Spread Sheet)	$300.00
Fox Pro (database)	$300.00
Quark Express (Desktop Publishing)	$550.00
Miscellaneous Games (3 games)	$150.00
Shipping charges	$100.00
Total System Cost	$3,489.00

Now, I call that a bargain for a basic system, don't you? If you haven't been sitting so far, I suggest that you sit down for the rest of this article because the light is about to shine. The cost associated with upgrading your existing Commodore system would be as follows:

CMD HD-40 w/RAMLink 1 MB and RTC	$625.00
JiffyDOS (1571D)	$24.95
24 pin Printer	$200.00
Printer Interface	$45.00
Mouse	$49.00
GEOS (Write/Paint)	$44.00
GeoCalc64	$40.00
GeoFile 64	$40.00
GeoPublish	$45.00
Miscellaneous Games (3 games)	$30.00
Shipping Charges	$20.00
Total System Upgrade	$1,162.95

OK, we've managed to rack up a bill for a little over a thousand dollars. By looking at our list you can see that most people already own most of their software, a few might need to upgrade their printer and everyone owns far more than three games. So for a few hundred dollars, you can push your C-64 or C-128 to the limits without having to fork out more than three thousand dollars to "Upgrade" to a 486.

A recent article in one of the major PC publications estimated that the typical MS-DOS user will have to spend an average of $2,500.00 every two years to keep their system current! That alone makes me want to run out and buy a new PC... how about you?

The focus of this column is... well, there is no focus. If something really bugs me I'll write about it. And if I get an articulate letter from an outside source, I might publish it. So if something really bugs you, and you can provide me with a reasonably well written letter, I might just give you center stage. Subjects can range from serious issues to satirical rambling about any computer related topics. So take a few minutes and let us hear your thoughts!

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Will our favorite 8-bit machines become roadkill on the Information Superhighway? Find out why we don't think so!

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Teach your hard drive new tricks when we present a tutorial on using SCSI commands with CMD hard drives.

Hard Tips

When your C-64 or C-128 starts acting strange, there may just be a simple solution. We'll take a look at what you can do yourself.

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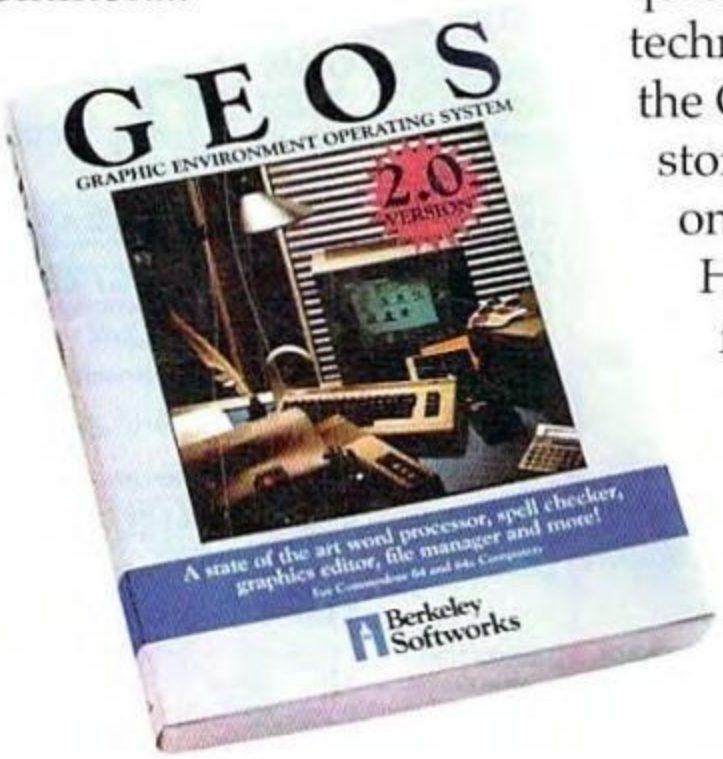
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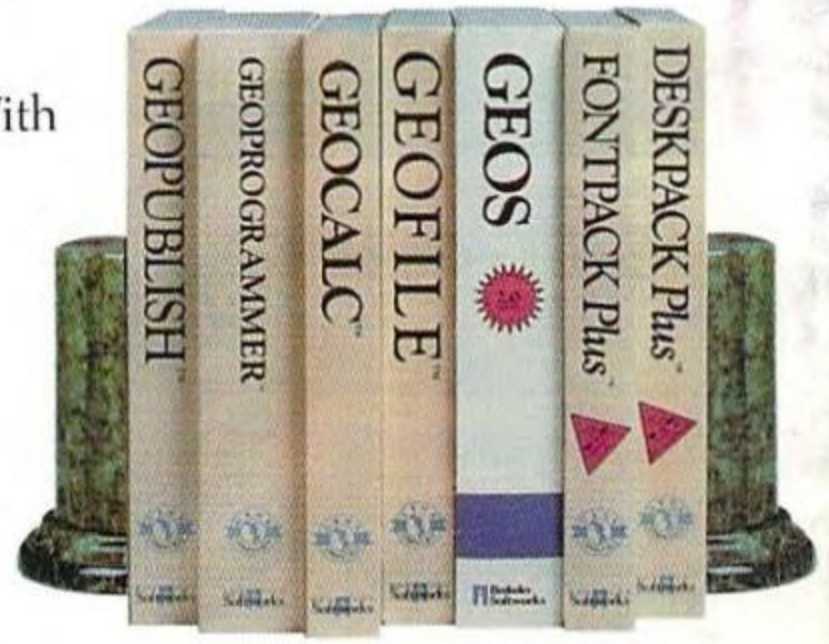

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